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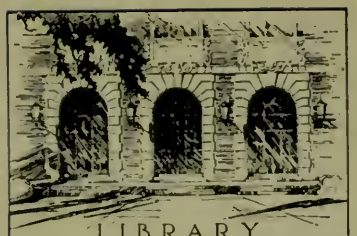

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James Truman

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AT THE

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Addresses, Essays and Discussions.

ANCHORAGE OF PROXIMATE FILLINGS IN THE BICUSPIDS AND MOLARS.

By G. V. Black, M. D., D. D. S., Jacksonville, Ill.

In order to safely stand the test of usage a filling that is exposed to the strain of mastication must be able to support the entire force capable of being exerted in the closure of the mouth. The great mass of proximate fillings in the bicuspids and molars are in composite cavities, that is, proximate cavities that are also open to the occlusal surface, and are thus exposed upon one surface to the force of mastication. It is especially of this class that I now propose to write. These fillings must be able to bear the entire strain exerted by the most forcible closure of the mouth. It may be said that the filling itself is not called upon to bear all of the strain of the closure of the jaws, but this relates only to the more ordinary usage of the teeth. At some time a bit of bone or other hard substance will be caught upon the filling itself and take the entire strain, and if its anchorage is insufficient it will be displaced.

The dental apparatus is indeed formed on this principle. Any one tooth or any part of a tooth is capable of taking all the strain that can be brought upon it by those teeth opposing it in the opposite jaw, or is capable of bearing all the strain that can be exerted by the muscles which close the mouth. Were this not so the sound teeth would be continually liable to fracture or displacement by bits of hard substances inadvertently caught upon them in the act of mastication. It is on this principle that bridge work has become a success. When we make a bridge occupying the greater part of one side of the mouth and supported by a tooth at either end we find either one of these teeth supporting the entire

strain brought upon the bridge. This could not be the case had each tooth not been primarily able to support the entire strain of the closure of the jaws.

What is this strain? I can, with my right hand, grip one hundred and twenty pounds, as measured by an apparatus designed for that purpose. With what force can I close my jaws? So far as I know, we have no apparatus for measuring the force of the bite and in the more scientific sense it remains an unknown factor. It must, however, be much greater than the grip of the hand, and amounts to hundreds of pounds. Hans Block of Dresden, Germany, in his papers on mastication in the *Dental Cosmos*, 1893, page 187, states that some acrobats can close the mouth with a force of five hundred pounds, and that ordinary persons can exert

FIGURE 1.

FIG. 1. Lower first molar with mesio-occlusal cavity prepared to retain the filling by broad grooves cut in the buccal and lingual walls. These walls are too light—a common error. This and all similar cavities (in size) should be prepared by cutting a step or dove-tail into the occlusal surface as shown in Figures 3 and 4

a force of about three hundred pounds: But these statements do not seem to be based upon accurate determinations. The force capable of being exerted is much greater upon the posterior teeth than upon the anterior. This is on account of their different relation to the muscles closing the mouth? We find therefore that the posterior teeth are stronger and more firmly implanted than the anterior teeth.

Again what is the strength of tooth material. We know that the sound tooth has ample strength to withstand the full strain of the muscles closing the mouth. But how much has it to spare, how much may a tooth be weakened by caries and still withstand the full strain of the muscles closing the mouth. This again is an unknown factor, a matter upon which we have only common observation to guide us, we have nothing established by scientific methods.

If we seek to inquire into the strength of our filling materials

we will find the same to be true. We may be able to find scientific determinations of the tensile strength of gold wire or rods of certain sizes, but nothing of the tensile strength of masses of gold built up of gold foil. We may be able to learn from scientific data the crushing strain that will be borne by blocks of cast, or wrought gold, but we have no scientific data determining the crushing strain that will be borne by blocks of gold built up from gold foil. Both the tensile strain and the crushing strain of gold built up from foil are constantly brought to the test in fillings, but we have had no means of accurately determining either. We have only the observation of practical experience, unscientific and in-

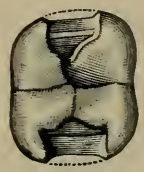

FIGURE 2.

FIG. 2. Lower second molar with mesio-occlusal and disto-occlusal cavities. The mesial cavity is prepared for the retention of the filling by broad grooving of the buccal and lingual walls, with the addition of a small step cut to the distal which is mainly to destroy the influence of a slope toward the open cavity made by the penetration of caries under the enamel in this direction. In this case the buccal and lingual walls are too light to be depended upon to support a heavy strain, and therefore the step should be extended into the central fossa for stronger anchorage, and the grooving of the buccal and lingual walls omitted.

The distal cavity is smaller, and the filling might be supported by broad grooves in the buccal and lingual walls, but a small step has been cut toward the center of the crown, giving additional support. The dotted lines show the contour of the completed filling.

accurate. This paper then will necessarily be based upon this latter class of observation, not only as to the tensile and crushing strain that will be borne by gold built up from foil, but also the strain required to fracture the walls of cavities that my be depended upon to sustain the load that may be brought upon our fillings. The rules laid down will be those derived from experience and more or less close and careful observation.

A failure in the anchorage of fillings is shown first by the filling being dislodged, or forced out of the cavity by the force of mastication. Second, by breakage of some wall of the cavity, against which anchorage has been placed. Third, by a slight

movement of the filling under the strain of usage which is sufficient to render its margins imperfect, or leaky.

Failure of the first kind is rare among the better class of operators and occurs only as the result of some oversight or accident.

The second is much more frequent than it should be, and results from errors of judgment in the arrangement of the strain upon the frail walls.

The third seems not to have been generally recognized. It occurs when the *size* of the anchorage points are insufficient, so that there is a bruising of the metal under the strain of usage in such a way as to allow the filling to move slightly, and thus render the margins imperfect. This gives opportunity for the recurrence of decay.

FIGURE 3.

FIG. 3. Lower first molar with disto-occlusal cavity, with step cut into the occlusal surface for anchorage, and showing the wide cutting to the buccal and lingual for the prevention of the recurrence of decay. The dotted line shows the contour of the completed filling. There is no grooving whatever in the buccal and lingual walls. The filling is supported entirely by the seat at the cervical wall and the step or dove-tail in the occlusal surface. Compare this with the seat and step shown in figures 4 and 5.

This kind of failure may be illustrated in this way: A headed bolt is put through a metal piece and made tight by a nut or by riveting. Strain is brought upon the bolt and after a time it is found that the metal composing the head has been crushed sufficiently to loosen the nut by which it was made tight. The strain is not sufficient to pull the head off the bolt. It does not give way in the generally accepted sense. If the bolthead had been larger so as to bring more metal in contact there would have been no loosening, for the reason that the metal composing it would not be bruised, condensed, or crushed by the strain. In fillings, when the amount of surface of gold in contact with dentine to form the resistance to strain is insufficient, the gold, being very malleable, will be bruised or crushed enough to allow the filling to start sufficiently to render the margins imperfect. Like the bolthead, it does not pull out, for after a certain amount of give it becomes firm

in its position, but it allows recurrence of decay which soon undermines the filling. I will refer to this again later.

In the proximate cavities in the bicuspids and molars, which include some portion of the occlusal surface also, it is necessary to provide in anchorage, against two important directions of strain, the *crushing strain* and the *tipping strain*, or the ability of the filling to support the load brought upon it and the ability to withstand lateral strains calculated to force it out of the cavity.

The crushing strain is the force of mastication brought directly upon the surface of the filling. This strain is in turn transferred through the filling to the cervical wall of the cavity in all of the class of cavities of which I am speaking. Therefore it is the cervical wall of the cavity that must carry the load. In this I meet

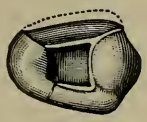

FIGURE 4.

FIGURE 5.

FIGS. 4 AND 5. Left upper bicuspid with mesio-occlusal cavity, which is very broad on the mesial surface. (The artist has not shown quite the full breadth of the cavity in figure 5.) In figure 4 the dark lines show the broad square cut seat in the cervical wall, squared out at the angles as seen in figure 5, and the cross line in figure 4 shows the seat in the step cut in the occlusal surface, while the depth to which this is cut is shown in figure 5. The dark lines at the buccal and lingual walls of the cavity in figure 5 show the position of slight grooves that may sometimes be used as a convenience in building the filling, but not intended especially for anchorage. The filling is supported by the seat at the cervical wall, and by the step cut into the occlusal surface. The dotted line shows the contour of the filling.

with two forms of insufficiency which combine to cause failure. First the seat of the filling is insufficient in size. Second, the seat of the filling is defective in form. This seat is the cervical wall of the cavity to which the force of mastication is transferred. In order for the filling to bear uninjured the strain of mastication the seat of the filling upon the cervical wall of the cavity must be sufficient in extent to carry without injury to the wall of the cavity, or the filling material, the strain of the closure of the jaws, otherwise the walls will be crushed, or the gold resting upon it will be crushed, either of which will be a cause of failure. For if the gold or the wall, give in the least the margins of the fillings become imperfect and leaky, and recurrence of decay with the final loss of the filling is the result. The seat of the filling must be so shaped

that there will be no tendency to sliding under the influence of heavy strain. This constitutes two essential factors, extent of the surface of the seat of the filling and the form of the surface. The extent of the surface forming the seat of the filling at the cervical wall is often much limited by the circumstances of the case and then must be supplemented in other positions. For instance, I may find a cavity involving a considerable extent of the occlusal surface for which no sufficiently broad seat in the cervical wall can be had on account of the proximity of the pulp. In such cases it is necessary to form a step to the occlusal of the pulp, or between the pulp and the occlusal surface, which will serve as an additional seat. In this way the extent of surface may be increased.

Again, the form of the seat is as important as its extent. There is no form of surface that will carry a load placed upon it so well as a flat surface at right angles to the direction of the strain.

FIGURE 6.

FIG. 6. Upper first molar with disto-occlusal cavity and with step cut into the central fossa to support the filling, also an additional small step along the line of the disto-lingual groove. This small step is made to remove a slope toward the open cavity that otherwise would have occurred on account of decay along this groove going deeper than it was desirable to cut the principal step.

There should be neither slopes nor rounding of any kind and of all things there should be no slopes toward the proximate surface of the filling except the beveling of the enamel margin necessary to the formation of a perfect marginal edge. Every such slope tends directly to the displacement of the filling with every crushing strain brought upon it. These two factors, size and form, of the seat of the filling are of first importance in every proximate cavity.

I have said that the size should be sufficient to bear the whole strain of the closure of the jaws. At first glance this would seem to indicate that the size of the seat of the filling should be the same for all proximate fillings, for each, large or small, must be able to bear the whole force of the closure of the jaws, and yet this does not hold, for after all a seating surface larger than the surface exposed to the crushing strain cannot add to the strength of the

filling unless it can be shown that the filling material is capable of sustaining a greater crushing strain than well supported tooth structure, which it certainly will not, whether it be gold or amalgam. Therefore, if the seat of the filling be well formed there can be no advantage in making it larger than the surface of the filling exposed to the strain. It is true, however, that the smaller fillings are not the stronger fillings. But while within certain limits we may improve the strength of small fillings by making them larger, we cannot improve them by making the seat of the filling larger than the exposed surface. This is as much as to say that all that gold will bear is all that it will bear under a crushing strain. The weakest portion will give first, whether it be the cervical or occlusal and either will destroy the filling.

Therefore, in fillings of this character there should be no undercuts in the sense of making the filling broader bucco-lingually at the cervical wall than at the occlusal surface, for whenever this is done every crushing strain has a tendency to cause the filling to leave the walls of the cavity at all points of undercut. The filling will be much stronger if the walls are so cut away that the cavity will be slightly broader at the occlusal surface, for in this case the buccal and lingual walls will become a source of support instead of a source of weakness. Also the building of the filling solidly and perfectly will be facilitated. This matter of so shaping the cavity that the building of the filling will be made easy should not be ignored. The plea that tooth structure should not be sacrificed is wrong both in theory and practice. When a carious tooth is presented for operation the question to be answered in the operation is, how can this tooth be made strongest, or how can it be made to endure the longest, giving good service. The question of saving this or that portion of the tooth structure simply because it is tooth structure should not be entertained for one moment. The problem is the putting of the tooth in the best condition for endurance and service. I have lost all respect for this *cant* about reaching around corners and working in awkward positions for the purpose of saving valuable tooth structure. Operating in very awkward positions tends to bad performances and the loss of the teeth under treatment. But in cases where it is clear that the conditions are such as to require difficult operations I have the greatest respect for the man who can do them successfully. And such cases occur sufficiently often, cases in which awkward operations must be

made in order to conserve the strength of the tooth, filling included, but these are exceptions to the rule. Generally the art of so excavating and forming the cavity as to render the introduction of the filling simple and easy is to be regarded as an essential element of skill.

The tipping strain is the result of any force that is brought in such a way as to pry a mesial filling to the mesial, or a distal filling to the distal, and thus throw it out of the cavity. When a large cavity in a molar or bicuspid is perfectly contoured rebuilding its marginal ridge (which is unnecessary) this strain is often very great, especially if the cusps of the opposing teeth strike in such a way as to bring a strong mesial or distal pressure. This strain is, however, much under the control of the operator, who can, and generally should so form the surface of the filling as to reduce this strain materially without too much reduction of the usefulness of the occluding surface. This manner of reducing the tipping strain by rounding off the surface is often carried much too far, so far indeed as to materially lessen the usefulness of the tooth or even to cause serious wedging of food between the teeth and thus destroy the usefulness of both this and neighboring teeth. As to this point no ironclad rules can or should be given. The occlusal surface of the composite proximate filling should be more or less rounding toward the proximate surface. 1st. If the anchorage against the tipping strain is ample it should be built to full easy occlusion except that the marginal ridge should not be restored. 2d. If the anchorage against the tipping strain is not considered as perfectly good and strong, the occlusal surface should be rounded toward the proximate surface more or less, and in such a way as to cause food to slide over the filling without being so caught as to cause a serious tipping strain. However, this rounding should never be carried to such an extent as to cause food to wedge into the interproximate space and thus become a source of injury. The filling must be made to protect the interproximate space whatever else be its shape. In many cases the tipping strain may be materially reduced by grinding away a cusp from an opposing tooth or modifying its form so as to change its direction of force.

This strain is not alike in all positions. The teeth generally have more or less mesial inclination, that is, they do not occlude perpendicularly end to end, but following the curve of the arch

they are more or less inclined to the mesial. Again the motion of the lower jaw is not directly up and down, but swinging on the condyles, its motion is in the arc of a circle closing upward and forward. It happens therefore that in the bicuspids and molars of the upper jaw the tipping strain is much greater in mesio-occlusal cavities than in the disto-occlusal, because the motion is such as to bring the crushing force in a direction calculated to force them out of the cavity toward the mesial. This strain is also greater in strongly bell crowned teeth than in thick necked teeth, because of the greater *overhang* of the mesial surface. This should be remembered and a sufficient safeguard provided. In the lower jaw the mesial and distal cavities are about equally exposed to tipping strain. Some writers have stated that the distal surfaces of the lower teeth were most exposed to this strain, but I think a close study of many models will dispel this idea. In special cases, especial liability to strain in this direction or that will have to be guarded against particularly when teeth incline more than usual in any direction. So much as to the means of rendering the tipping strain as light as possible.

The means of anchorage against the tipping strain will next claim our attention.

In small cavities, those occupying one-third or less of the proximate surface, bucco-lingually, anchorage against the tipping strain may be made by grooving the buccal and lingual walls of the cavity. These grooves should be placed as deeply (i. e. as far as possible from the surface of the tooth) in the dentine as the depth of the cavity will allow. There is nothing gained by cutting them deeply into the buccal and lingual walls while the depth materially weakens the tooth. They give greater strength when made broad and shallow than when made narrow and deep. The rule is that the greater the surface of gold, solidly packed, that can be made to impinge upon the anchorage surface the stronger the anchorage will be. Narrow deep grooves are contraindicated while pits are valueless for this purpose.

I have spoken of this before, giving the illustration of the small bolthead which has been sufficiently bruised or crushed by the strain brought upon it to have become loosened. Now gold is very malleable and when only a small surface of gold is depended upon to hold against the tipping strain, this surface is liable to be sufficiently crushed, battered or condensed, by impingment against

the narrow points of anchorage to allow the body of the filling to part slightly from the walls.

With this slight condensation of the gold the increased hardness becomes sufficient to withstand further movement and the filling remains firm. But the movement has destroyed the value of the filling by rendering it leaky and thus giving opportunity for the recurrence of caries. Of the correctness of this I have satisfied myself by a number of observations in which the cause of the movement could not be mistaken because made before decay had occurred. After decay has occurred one may often be uncertain whether or not the margins may have been imperfect from the beginning. For these reasons narrow grooves should not be depended upon to sustain fillings. It is much better to anchor against slight slopes having the elements of the dovetail in which the strain is distributed over a more considerable surface, thus preventing the condensation of the gold against the anchorage points.

When the cavity occupies more than the middle third buccolingually of the proximate surface, the rule should be that no attempt be made to anchor against the tipping strain by grooves in the buccal and lingual walls, for then the necessary grooving will become a source of weakness and render the walls too frail to safely support the filling. Indeed when a cavity has become of this extent it ought to be cut widely to the buccal and lingual in order that its margins may be so removed from near approach to the neighboring tooth as to render them self-cleaning—extension for prevention of recurrence of caries—and this renders any sufficient anchorage by grooves in the buccal and lingual walls impracticable. In this case, and in all larger cavities the anchorage should be made by what is commonly known as a dovetail cut into the occlusal surface of the tooth. This cut should not be made very deep, a trifle more than the thickness of the enamel generally being sufficient. Indeed a deep cut in this position becomes a source of weakness instead of strength for the reason that it renders the buccal and lingual cusps, especially in bicuspids, liable to be split off by the force of the occlusion, a matter that must be especially guarded against. We must always remember that in preparing our anchorage we should guard the strength of the tooth in its entirety. This dovetail in the occlusal surface should have upon its buccal and lingual walls such a form that the filling cannot slide out of the cavity. The bottom of this cut should be

flat and well squared out at its angles in order to form a firm seat for this portion of the filling, and especially there should be no slope toward the open cavity. In many cases the original decay will be of such form as to make it difficult to avoid some such slopes, but every available means should be used to form steps, and in this way destroy the influence of the slopes.

In a few cases I have seen solid fillings in such dovetails stretched by the force of mastication sufficiently to allow the main portion of the filling to leave the buccal and lingual walls of the cavity and thus destroy the filling. For this reason I often fill these anchorage slots with platinum gold when a very heavy filling is to be supported. Judging from close observation directed to this point I am of the opinion that platinum gold well welded and condensed will bear from one-third to one-half more strain than pure gold in such positions. The anchorage slot can therefore be that much smaller and give the same support, and the cusps of the tooth need not be weakened by so deep a slot.

In cases in which the buccal and lingual walls, one or both, are thin and frail, so that a portion of the wall of the cavity becomes liable to breakage by catching some hard substance upon it, it should be cut away sufficiently to build the gold over its margin in such a way that the strain will come upon the filling itself instead of the wall. This part of the filling should be carried sufficiently far that nothing can catch upon the margin of the frail wall and also the filling material should be thick enough so that it will not be crushed by the strain of mastication. A very thin layer of filling material over such a wall is worse than useless, for it is likely to be crushed against the wall in such a way as to break it down.

In this paper I have said nothing about the anchorage of fillings in cases where the pulp has been removed. In all of this class the more direct subject for discussion would be the conservation of frail walls, a distinct subject in itself.

DISCUSSION.

Dr. George H. Cushing, Chicago: It is a very embarrassing position to be placed in to be asked to open the discussion on a paper with which you fully agree in all respects. A man should be selected for the opening of a discussion on a paper who differs somewhat at least from the author of the paper, so that it is useless for me to spend much time in talking about it. I can only empha-

size the points made by Dr. Black. I presume none of the members present have ever seen or read of a discussion of this subject in the manner that it has been presented to-night. I know of nothing in the literature of the profession that tells us anything as forcibly and clearly as has been told us to-night regarding this matter, which I feel is of as great importance, perhaps greater, than any one principle governing the operation of filling teeth. The older men have seen more than the younger men of the profession, the results of operations during a long period of time by men of all sorts of ability; and many failures have been observed that were unquestionably due to a want of understanding of the mechanical principles upon which all operations must be based in order to be successful. Any man who understands mechanics cannot fail to see, it seems to me, with the delineation which we have here in these admirable pictures, the force of reasoning which Dr. Black has given us. I fear that some of you perhaps do not realize the importance of this, and I merely wish to emphasize what he has said and to ask you to study it very carefully and thoughtfully, and I have no doubt that some of you will produce better results in your operations if you give the subject the study that it deserves.

Dr. Patrick: I have a few remarks to make only in regard to that portion of the paper which dwelt upon the force (crushing) that the human jaw was capable of exerting. I am induced to make these remarks after having experimented in that line to a considerable extent. I have not published anything, but I simply cite it since Dr. Black referred to it in his paper. The strength of the human jaw I was induced to investigate on account of several articles that I have read on the subject at various times, which I conceived at the time to be exaggerations. Being acquainted with several engineers both in the army and navy, on one of my visits to Philadelphia, I spent a week at the government works at Bethlehem. One of my friends has had charge of the works for the last three years, and I knew he had machinery to test tensile strength, the elastic limit of material, because every piece of metal turned out for government use has to come up to a certain standard, consequently they have some delicate machines. I first commenced my experiments with different kinds of nuts, the ordinary hickory nut, the three-cornered Brazilian nut and black walnut. I amused myself feeding hogs with them from time to time, and I noticed

that a hog in attempting to use these nuts could not crack them in every direction; in other words, the hog turned them up and finally crushed them. I also noticed that when I struck him on the head it made him drop the nut. He never crushed the nut at the pole, so he turned the nut in his mouth as a human being would to get its weakest point, and crushed it.

That was the initial point of my education. There was no satisfaction in that. While on my visit to Bethlehem, I obtained quite a number of nuts of different sizes such as I have mentioned. I put them under a machine to try their resistance, and there were crushing machines there which registered anything from a grain up. The result was that a Brazilian nut at the equator—that is between the poles—required eighty-five pounds to crush it; at its weakest point at the pole, ninety-eight pounds. The common hickory nut at the equator at one side—that is on the side on which there is no stem—seventy-four pounds; at the stem eighty-eight pounds; at the poles 140 pounds. Black walnut at the equator, 110 pounds; at the stem, ninety-five pounds; at the poles, 600 pounds. We then selected some of the strongest men we could find (laborers), and we had them cracking hickory nuts at these different points, and only one man cracked a hickory nut at the equator away from the stem. None of them could crack a walnut. So approximately, I set down a powerful human jaw at ninety-five pounds. I have heard the enormous strength of the human jaw stated at from 500 to 800 pounds. I will say in advance I am now making a machine to test the strength of the human jaw, and I have met with a good many difficulties in connection with it. I think I will be able to complete one by the time we meet in Chicago, by which I can measure the strength of the human jaw of 2,000 persons, and I guarantee that none of them will exert a pressure of over 100 pounds.

Another thing to be considered in the mechanism of the jaws that we should never lose sight of, is that when an animal seizes anything between the molar teeth, there is an addition of strength. There is a power exerted there in addition to the muscular force. The power is in the wedge-shaped form of the cusps, and the animal not only uses that power, but he uses the wedge produced by the fitting of cusps into the depression, which adds to its power. Aside from that the lateral motion that is exerted when that wedge and that power is brought into play becomes active when the

crushing power is exerted. I doubt whether the actual muscular power is more than one-half of the power that is exerted, because nothing is more powerful than the wedge, and the slightest lateral motion in connection with it still increases it. I merely mention these facts to hold gentlemen in suspension in regard to the immense power of the human jaw that has been so frequently stated. The jaws are strong enough without exaggeration.

Dr. Noyes: It has been suggested to me that probably the crushing force that can be exerted by the jaw may possibly be several fold greater when the molar teeth are approximated within one-sixteenth or one-eighth of an inch than when we have put a hickory nut between them, because the power of the levers and of the muscles acting upon them is enormously greater than in the widely open position. The muscles act in an unaccustomed manner also, when the mouth is opened widely.

Dr. Patrick: It is contractile power, not the power of impact. You could not make that difference. It is a lever of the third character. The crushing power is exerted gradually and the body to be crushed is between the fulcrum and the power.

Dr. Noyes: I have not given particular study to this subject, and possibly I am wrong, but the diminished muscular power is certainly apparent to our consciousness when we try to crush between the molars anything so large as to open the mouth to its widest extent.

In regard to this general subject, there is perhaps very little more that can be said, and I wish only to make the suggestion that the mechanics relating to the preparation of cavities and the anchorage of fillings bears a close relation to the structure and relation of the dentine and enamel of which the tooth is formed. These two elements are different in their histological and structural relations, the dentine in the interior with one form of structure and the enamel over it having a very different structure and a definite and particular cleavage.

Three things must always have proper attention. The structural characteristics of the dentine, the size and location of the pulp-chamber, and the thickness, cleavage, and developmental lines of the enamel. Of course all this is implied in what has been said. I only wish, if I can, to state them so concisely that it may become easy to refer all the details of the work to these fundamental elements.

Hans Block, Dresden, Germany: Mr. President, may I take the liberty of saying a few words with reference to the power of the

muscles concerned in mastication. It is estimated at 300 pounds maximum in the ordinary healthy individual, but I think in eating we do not use more than twenty-five pounds. I do not see why any greater power should be required for the trituration of normal food. A case is reported in *The Dental Tribune* in which a man is said to have lifted a horse and carriage containing four persons with his jaws. This acrobatic feat would require a power of at least 600 pounds.

While listening to Dr. Black's able paper on the anchorage of fillings, a paper which I thoroughly enjoyed, I regretted that he did not add instructions as to the most suitable instruments to be used in making anchorages, for we know there are ten or fifteen kinds of burs, and it is desirable to use the best to secure successful results. If I understood him correctly, he said the smallest kind of bur is not suitable for making retaining points. Dr. Ottolengui uses the smallest bur. It is difficult to use the smallest kind of bur for this purpose. Personally, I use the next in size.

There are other points I would like to hear Dr. Black touch upon, namely, the making of morsal contours, also the instruments for preparing enamel margins. I think in the back teeth many practitioners use only large burs for smoothing the marginal edge. It would be instructive to us to hear something about the instruments to be used.

Dr: Black: I would be glad indeed to reply to what Mr. Block has said in regard to the instruments to be used in the preparation of these cavities; but let me say, I think we are most unfortunate as regards our nomenclature of instruments of anything in dentistry. It is almost impossible for one to convey to another any accurate idea of the forms of instruments. We have not the names for the instruments; we have hatchets, hoes, chisels, burs, but we have not the means of more closely designating such instruments as we use. If you will permit me, I will say, however, that I think the general use of burs for the purpose of preparing cavities is one of the great evils with which we have to contend. (Applause.) I use burs but little. I use chisels and excavators of various forms for most of my preparations. If I have a groove to cut along a wall here or there (illustrating), it is rare that I use a bur of any kind. Without a blackboard I could give you perhaps no certain instruction as to the instruments I would use. I use a narrow chisel by which I can cut these grooves and shape them, not a groove here (illustrating), but a dovetail. There

are some things we can do easier for our patients with excavators or chisels. In the first place, we cannot make our shapes as we want them with burs. Once in a while I have a case where I use a bur for some portion of the cutting, but rarely or never use a bur for the finishing of my cuts or for the groove.

Another point. While talking of the manner of grooves before putting in amalgam, in making amalgam fillings, where a groove is made by a bur, which is so common to the dental profession, the groove may be made insufficient, or it may be sufficient. The amalgam is put in with an instrument of considerable size, pressed firmly into the cavity—what is the result? The mercury is pressed out into this groove, carrying with it very little of the alloy, and the portion that we are depending upon for anchorage remains comparatively soft, and the anchorage is a failure. Then we hear that the amalgam has shrunken. If you start your filling properly, and condense the amalgam into your grooves thoroughly with small points, your margins will remain perfect, especially if you have made your groove broad enough to get sufficient contact.

I was very glad to hear Mr. Block speak on the subject of the crushing strength of the jaws, and although we may have no definite knowledge regarding it at present, it will start some one to thinking about it and do good in that way.

I was glad to hear Dr. Patrick speak of the means used by him for making measurements. The crushing strength of the jaw is considerable, and the means used are undoubtedly insufficient. We must get the teeth as closely together as possible in the weighing of the crushing strain. The jaw, with the mouth wide open as with a large walnut, cannot exert its normal force—at least, I would judge so from my own efforts and from the efforts I have seen.

Speaking of the hog, I have seen the hog pass a walnut forward in his mouth in order to crush it. The mouth was spread open so widely by the walnut between the back teeth that he could not get the force of his muscles. I hope Dr. Patrick will weigh the force of the human jaw by the machine he speaks of. I shall certainly be dissatisfied unless the teeth are brought as closely together as circumstances will allow. It is possible to contrive an instrument to bring them close together. If I had been well this spring, Dr. Sawyer and I would have been able to exhibit such an instrument here to determine what this force is. But it will be done soon, and I shall be glad to see what there is of it.

THE EFFECT OF ERUPTIVE DISEASES ON THE TEETH.

By John J. R. Patrick, D. D. S., Belleville, Ill.

There is no portion of the living body so complicated, so subject to varied and numerous changes, and that presents so many obstacles to treatment when diseased as that portion of the human skull which is occupied by the face. The greater portion of the anterior section of the human skull is a mere light framework of delicate plates of cancellated bone, presenting very little strength when divested of its soft tissues and cartilage. All the bones that form the face are mere shells so arranged as to form chambers. These chambers are lined with mucous membrane, continuous and communicating with each other, with the pharynx and with the nasal and oral cavities. It is in this region where all the special nerves are clustered, and the amount of involuntary nerves with which this region is endowed makes it the very center of involition. The vital activity of this portion of the human body is well seen in the frequent flushing of the face in early childhood, when the sinuses and processes are forming and the teeth are developing. At this period the process of nutrition attracts more vital activity to these parts than can be found elsewhere, and can only be compared to the vital redundance of the blood vessels in the antlers of a stag when growing, or the orgasm of a gravid uterus; even in advanced life there is always more or less turgescence present. The abundant supply of involuntary nerves and the extensive capillary system with which this region is endowed, bestows upon the human face an independence of the will, so that that which we would most wish to conceal is often betrayed—as in grief, joy, melancholy or when the blood rushes to the face in a blush, or retreats with equal rapidity leaving the face pale as in fear. Every individual when moved by sympathies is conscious of a peculiar sensation in this particular region before the phenomenon takes place, and for these reasons the illustrious John Hunter called this region "The sensitive center" of the human body. The tendency of this

part of the body to be overrun with red blood, disposes it to become more frequently the seat of affliction; erysipelas is oftener detected in this region than in any other, and it is the principal seat of pustules in small-pox and ecchymosis in other eruptive fevers. The laws that govern life, marvellous to the human intellect as they are, appear to be incapable of causing the teeth cased in their hard enamel to expand and grow as the softer bones; and hence has arisen a provision more extraordinary still. A series of twenty deciduous teeth are provided which successively come into use soon after birth; previous to three years they are not all present, and later than six years they begin to drop out, by a physiological process of exuviation, and are replaced successively by others which are to endure for life. The expression "teeth of the first set" meaning the deciduous teeth, is likely to lead to error, for the reason that the six upper and six lower molars are teeth of the first set, which are never replaced by others. In a human being of twenty-five years of age the permanent series of teeth, thirty-two in number is generally complete. Twenty are teeth of replacement, or succedaneous teeth, which replace the twenty deciduous that are thrown off; the twelve molars which are to the posterior have no predecessors, and are not mutable.

Now the greatest number of teeth to be found in the human jaws at one time, in a state of progression and retrogression are in the jaws of a child from five to five and a half years old. At this age there are forty-eight teeth—twenty-eight permanent teeth more or less calcified and ossified, and twenty deciduous teeth undergoing a retrogressive physiological metamorphosis; but the germs of the third molars at this period are not present. It is only from a child between four and five years of age that a perfectly formed deciduous tooth can be obtained, for we find that before the fourth year the root ends of these teeth are not quite formed, and after the fifth year they commence to exuviate. In all the transmutations which take place in the retrogressive and progressive phenomena presented by the teeth the surrounding tissues are built up and removed with equal pace. All the anterior portion of the jaws are subjected to four changes during life. *First*, the progressive, and *Second*, the retrogressive metamorphosis of the twenty deciduous teeth with their processes. *Third*, the progressive, and *Fourth*, the retrogressive metamorphosis of the twenty succedaneous teeth.

In the posterior region of the jaws in which the twelve permanent molars are developed there are but two changes which take place: *First*, the progressive which commences in youth and continues until middle age, and the retrogressive which commences in the decline of life and continues until extreme old age. In the region of the molars the growth of the jaws is from the posterior to the anterior and vertical.

In the region of the succedaneous teeth vertical only; thus the arch in the succedaneous region is not increased in size but the whole jaws are elongated and the palate increased in depth. Now it is well enough to observe that the eight bicuspid teeth which belong to the permanent series in man are not preceded by teeth of the same character or form, nor do they occupy as much space in any direction in the form of their crowns as their predecessors.

They therefore are classed as a definite and separate species from the true molars. The deciduous molars which precede the bicuspids occupy a different position in their relation to the power that moves the lower jaw upon the stationary upper jaw.

Had they been succeeded by teeth with large, square crowns, with broad masticatory surfaces, they would have been comparatively useless after the development of the permanent molars, and consequent progressive growth of the jaws from the posterior forward. The usefulness of the deciduous molars for grinding purposes decreases soon after the sixth year or first permanent molars make their appearance, and from three to four years later the bicuspids take their place better adapted in form and position to the power that moves the jaw.

This arrangement as to the change of form in the succeeding bicuspids which occurs in man and the apes, does not take place in animals that have long jaws, as their permanent teeth are exact duplicates of their deciduous ones. This is owing to the different arrangement of the attachment of the muscles that move the jaw. The arrangement and development of the deciduous teeth in man are further examples of the same law; the cuspids appear a few months later than the first molar, but a little before the second molar; whereas in the second series of teeth the bicuspids appear before the cuspids; the deciduous cuspids being carried over to the eleventh or twelfth year, the last remaining teeth of the deciduous series; and there is no necessity for their earlier displacement, notwithstanding they are gradually removed from the power that

moves the jaw; being wedge-shaped they would always be of service in the anterior portion of the jaw. In point of lever power in the undeveloped jaw of man the deciduous cuspids represent the first bicuspids, the first deciduous molars the second bicuspids, and the second deciduous molars, the sixth year or the first molar of the permanent series. Thus we have presented in the human mouth remarkable instances of how the forces in nature modify and mould the forms of plastic material to suit the circumstances that surround them.

These progressive and retrogressive changes commence in early fœtal life, and persist with *form* and *force* in strict accord with mechanical law. But nearly every germ, during the period of development, meets with obstacles, meets with contending forces; so that countless millions of the germs or seeds that are produced never come to maturity, but rot before ripening, and by far the largest number that do mature are warped, gnarled and twisted to such an extent that few can be said to be in that condition that physiologists call normal. Constant, unrelenting and persistent are the contending forces which govern life; an excess of either one or the other must change or modify the character of the organism upon which they act; and the wonder is to the observant mind, not that nature does her work so poorly, but that she does it so well.

Mankind may be said to possess great uniformity of structure, so much so that they bear a strong resemblance to each other. This is only true in a general sense; in a special sense it is far from the truth, even in typical cases, as in distinct tribes of men, we find great variation in structure. When we reflect upon the infinite complexity of parts and the necessity of each part developing with equal pace, in order to produce a perfectly formed organism, we are driven to the conclusion that a perfect organism would be an anomaly among all other organisms.

During a natural lifetime there are developed in the oral cavity of a healthy human being fifty-two distinct and complex organs, which include the twenty deciduous and the thirty-two permanent teeth.

Now in a healthy twenty-five year old subject in which the teeth are fully developed it would be difficult to find a perfect set of teeth fulfilling all the requirements of *Form*, *Volume*, *Number*, *Direction*, *Structure*, *Nutrition* and *Disposition*, in relation to each

other, without seeking an ideal standard of perfection wherewith to judge them.

Whatever may be said in regard to the malformation of the bony portions of a tooth there can be no question as to the time in which defects of the enamel are produced, and as this portion of the tooth is the first to form, and is formed before it is exposed to external influence, the cause of its malformation must be internal, or defect in *Nutrition*, and must be sought for in its early formation. The development of the deciduous teeth commences in the seventh week of *intrauterine life*.

Seventh week: The papillæ of the first deciduous molars make their appearance.

Eighth week: The cuspids.

Ninth week: The central incisors, and soon after, lateral incisors. The germs of these teeth are observable at the periods stated, but their follicles are formed later.

Tenth week: The sides of the primitive groove before and behind the first molars approach each other, sending off processes from each side, which meet and inclose them in follicles.

Eleventh week: During the latter part of the tenth week similar follicles are gradually forming around the cuspid teeth, and the papillæ of the second molars make their appearance.

Eleventh and twelfth weeks: The incisor follicles are formed.

Thirteenth week: The follicles are formed for the second molars. (The germs and follicles of the lower teeth do not appear quite as soon as the upper.)

Fourteenth week: Provision is now made for the production of the teeth of replacement or succedaneous teeth, by a secondary groove immediately behind the primitive groove, in which the germs of the central incisors appear, next the laterals, next the cuspids, and lastly the first and second bicuspids, from which the sacs and pulps of the twenty anterior permanent or succedaneous teeth are to be produced.

Sixteenth to seventeenth week: The primitive groove has now extended itself back of the second molars, and from the floor of which the papillæ and follicles of the first permanent molars begin to develop.

The periods of calcification of the deciduous teeth commence during the sixteenth or seventeenth week of *intrauterine life* in the following order:

First, on the first molars,

Second, on the central incisors,

Third, on the second molars and lateral incisors.

Fourth, on the cuspids.

The first tooth germs that appear in the human subject are the anterior deciduous molars; they do not make their appearance through the gum however, until the incisors appear. The follicles of the permanent teeth are formed about the time the deciduous teeth commence to calcify but they undergo a period of comparative rest and do not commence to calcify until a little before or immediately after birth in the following order:

First permanent molars a little before or immediately after birth.

The central incisors five or six months after birth.

The lateral incisors eight or nine months after birth.

The cuspid teeth at nine or ten months after birth, but they do not come into use until after the first bicuspids.

The first premolar which is a bicuspid, commences to calcify at or soon after the second year.

The second premolars at three years.

The second permanent molar between the fifth and sixth years.

The third molar or *dens sapientiæ* begins to calcify about the twelfth year. This order of succession in calcification is described for the lower jaw, the teeth of which usually appear earlier than the corresponding ones in the upper.

I have entered thus far into a description of the origin and development of the teeth; in order to illustrate the detrimental influence of eruptive fevers on the teeth during the periods of their formation; and while eruptive fevers are not the only factors to be recognized in producing abnormal conditions in tooth development; I consider such fevers a prolific source of faulty nutrition in these organs; as the following cases observed in my practice will fully exemplify.

Mrs. S., during the fifth month of gestation was afflicted with scarlet fever—recovering, in the course of time gave birth to a child. This child's teeth appeared unusually early, the enamel discolored, pitted and granular and absent at the incisive margins and the teeth barely extended beyond the gum. He is now fifteen years old with all of his permanent teeth except the third molars. These second teeth, with the exception of a little decay, are in good

condition, the enamel smooth and white and all the teeth large and strong. Three years later another child was born, and soon afterward the first child contracted the measles and the second child also contracted the disease. In the course of time the deciduous teeth of the second child appeared, all in excellent condition, but were lost unusually early, and the second set appeared in the following order: The sixth year molar at four years. The central incisors at five years. The premolars between the sixth and seventh years; and the cuspids between the eighth and ninth years. All these teeth are discolored, pitted and granular, and the enamel is worthless as a protection to the dentine. Now a third child was born, who is now six years old, and has not been subjected to the same influences that his brother and sister were during the period of dentition and he enjoys the luxury of a good clean set of deciduous teeth. The first permanent molars that are now appearing are so far as observed, in good condition.

While the teeth during the process of formation are liable to be influenced by eruptive fevers, the alveolar process of the deciduous teeth, during the retrogressive metamorphosis which commences between the fifth and sixth years, is also liable to be affected by the same cause; for at this period all the nutrient vessels that supply the deciduous process are on the wane, and the low vitality of the parts makes this region a vulnerable point during the existence of eruptive fevers.

DISCUSSION.

Dr. G. V. Black, Jacksonville: I am glad to hear papers on such a subject as this, and if some parts of the paper had been extended I should have liked it better. The form of fault produced upon the enamel by diseases in childhood is of considerable importance. It is worth while for the dentist to be able to give an intelligent answer to the mother, father, or patient himself as to the cause of these defects. The injury is done. There is no cure. We cannot help it. But it is worth while that we be intelligent upon the subject. You will remember that some years ago this society published a little diagram which showed the average periods of the development of the enamel, and the different portions of the teeth were marked for the purpose of ready reference in regard to this subject. All I wish to say is, I am glad the subject has been brought before us and to urge the necessity that every dentist be intelligent before his patients.

Dr. William N. Morrison, St. Louis: I desire to express my thanks to the author of the paper if for but one thing, namely, the enormous cause for irritability that rests on the little ones at that time when they carry so many teeth—forty-eight. Just think of it for a moment. It has always been a very vulnerable point with me to watch at such an age. The Illinois Society published a little volume for the instruction of parents regarding children's teeth, but of course as I remember it, it did not contain the particular item regarding the marks made by eruptive diseases, and that to my mind accounts for a great deal of the disturbance that the little ones have.

I cannot account for the want of sympathy and tender care that some parents are void of at such times. When decay or lesions create a disturbance, the parents think something must be extracted in a hurry instead of being sympathetic and giving the little ones the care and attention that their cases demand.

Dr. I. P. Wilson, Burlington, Iowa: I think it is very generally understood by dentists that the marks upon children's teeth, or upon any one's teeth, are almost, if not always, the result of eruptive diseases. This, of course, is erroneous. Any illness that is serious enough to interrupt or suspend nutrition for any considerable length of time may mark the teeth. I have in mind a case of this kind. A child was in good health until between one and two years of age It was then prostrated with congestion of the lungs, and for several days was not expected to live. It remained a sickly child for two or three years, when it was again restored to robust health.

I watched with a great deal of interest the teeth of that child, for it was my own. When they commenced to emerge from the gum, I discovered that the incisors, cuspids and first molars were imperfectly developed. A line of wrinkled or shriveled enamel passed over the surfaces of these teeth, plainly indicating the period of imperfect nutrition. The child had not suffered from any of the eruptive diseases.

Dr. F. H. McIntosh, Bloomington, Ill.: I wish to relate an instance or two I had from the parents of children of defective enamel, that was occasioned, as they supposed, and as I believed at the time, in the development of the enamel organs while having a severe case of the measles and a severe case of typhoid fever. I do not throw this out as being scientific, but simply as a fact given to me by the parents, and I have noticed several other such cases. I inquired of the parents if the child at four or five years

of age had measles, scarlet fever, or some other eruptive disease, and they said yes.

Dr. J. W. Cormany, Mt. Carroll, Ill.: I do not know why it is when the subject of children's teeth in a convention of this kind is up for discussion, that there is an irresistible desire on the part of some members to pass it. Gentlemen do you know that the children are your patients afterward? Do you know that they should receive that care and attention far above what you give to older ones? I had my attention called to this matter only a few days ago by an Irish lady. She has been my patient for a long time. The subject of raising children and caring for their teeth came up, and she said to me, "Doctor, I have been coming to you for years, and you never gave me such a lecture as this before. If you had, I would have better raised my children than I have. I do not see why you did not tell me this long ago." I make the confession right here, that we do not talk enough to parents about their children's teeth. This subject should not be passed over lightly. I would like to have those who know anything about the teeth of children and their preservation to get up and tell us.

Dr. A. C. Hewitt, Chicago: I fully concur in the sentiments expressed by the last speaker. I would not rise except I wish to ask Dr. Patrick what deductions he draws from the premises that to my mind are perfectly incontestible. There is not a point in his paper that seems to me can be successfully controverted. What can we do about it. Shall the period of exposing the child to contagious diseases be put off beyond certain years? Should it be hastened, as is the custom with some parents? After an injury has been done by diseases such as Dr. Wilson spoke of, and we all concur with him that it is true, what shall we do? Is there repair for the teeth or for the broken, serrated enamel surfaces? Can we by food, by regimen in any way repair the waste or the damage that has been done? Evidently Dr. Patrick has given the subject a great deal of thought, and in his closing remarks I ask him to state what practical lesson we are to draw from his paper.

Dr. E. K. Blair, Waverly, Ill.: I would like to ask any gentleman present, when his advice is sought by his patrons, what he recommends them to feed their children. If meat and vegetables, what kinds, and how should they be prepared for the table? The idea is being advanced here that the character of the food deter-

mines the condition of the body largely, especially the teeth. I would like to hear from Dr. Harlan on the subject.

Dr. A. W. Harlan: The particular object I have in rising at this time is to emphasize one of the thoughts not brought out in the paper, and it is this: There are three kinds or groups of diseases that affect the development of the enamel of the teeth. One is what may be termed the eruptive diseases, another is syphilis, and another is what might be termed defective nutrition or convulsions. At the International Medical Congress, in 1881, in London, Magitot and several others entered into a discussion of the question of the markings of teeth, Magitot holding to the opinion that all of the various wave lines and ridges of the crowns of teeth were due to what he termed convulsions. Hutchinson practically said that nearly everything of that kind was due to inherited syphilis, and another gentleman contended that all of the markings of teeth, practically speaking, were brought about by the eruptive diseases, measles, chicken pox, scarlet fever, etc. The point I want to emphasize myself is this, that dentists should not conclude, as I have heard them say at clinics before now, that every case of lack of enamel about the crowns of first molars, or of ridges and little pits of enamel on incisors, cuspids or bicuspids, is due to syphilis, because probably in nineteen-twentieths of all the cases that are ever seen the syphilitic tooth has a peculiar shape. It is either crescentic in the central incisors, or approaching that, or more or less peglike in lateral incisors, and perhaps dwarfed in the first permanent molars. I will not say these markings are the only deviations in the shape of crowns of teeth, but they are totally different from the markings produced by the eruptive diseases. If dentists will only provide themselves with somebody's chart that will show the probable ages of calcification of the teeth, they can explain to mothers and nurses how certain marks appear and how to prevent these marks on children's teeth that are not yet sufferers from eruptive diseases. Of course, the thing is to prevent the child having the measles, chicken pox, scarlet fever, if possible, or any other eruptive disease, then its teeth are not marked. Children properly fed are not anemic. They do not have convulsions. I suppose the best thing for a child is to have good healthy parents, but they cannot all have them. They do not select their parents.

With reference to what a child should be fed on, in answer to

the question of the President (Dr. Blair), I do not suppose I am consulted as to what children should eat more than once in five or ten times, but I give a great deal of gratuitous information to people in that respect. I am not exactly an iconoclast or nihilist, but I believe in bringing up children as near a savage state as possible for a certain period. I am not afraid of their destructive tendencies. I would rather spend a little money to have them destroy useless things that are a little offensive to the eye and let them have good bodies up to a certain age than to have them learn how to make paper kites and indulge in useless things. I am not bringing my children up in that way. They are growing with good, vigorous bodies. The simpler the food the better, I think. I advise parents in that way. I tell them that their children cannot eat beefsteak unless the teeth are nicely shaped; that they cannot masticate it if the teeth are not in such a condition that they can eat it. In that event, I tell them to eat the cereals. I do not generalize, but I say a boy or girl should eat the kind of food he can chew and digest after he has chewed it. If he cannot chew it properly, after it is prepared in such shape that he can digest it easily, he should not be given such food. All children cannot eat oatmeal and digest milk. Some children must have fruit, and all of them are better for having fruit if they can get it. I do not see very much difference in the character of the teeth of children who are fed exclusively on oatmeal and other substances that are hard to digest, and that are not palatable and cannot be made so excepting by covering them up with a good deal of confectionery. I would rather have my children eat potatoes, beans, and drink milk and eat beefsteak than to take oatmeal if they have to cover it all up with sugar, consequently I do not insist on their eating that.

Dr. Hewitt: If a severe case of smallpox should occur, upon a child being inoculated, would it affect the teeth? If it would, ought not the inoculation to be deferred until such time as the teeth were beyond danger?

Dr. Harlan: With reference to vaccination, I have felt in my own mind that if it were possible to avoid the necessity for vaccinating children until 5 or 6 years old, it would be a great deal better. I do not know whether it is right or not. I won't say it is. With one exception, this practice has obtained in my own family. The first child was vaccinated at 6 months of age, and none of the others were vaccinated until ready to go to school. I

have seen some distressing symptoms from vaccination, but I would not attribute them to it alone, because they may have been due to some other cause.

DR. CUSHING: Symptoms on the teeth?

DR. HARLAN: No, but other physical symptoms that were extremely distressing. I would not advise anybody to wait and have their children vaccinated only when six years of age. I simply say that is the way I do.

DR. INGERSOLL: I will have to make another confession. I have not very much confidence in the old theory of the markings of teeth, that they were caused by eruptive diseases, constitutional disturbance. So far as I know, the theory rests upon tradition, not upon history. When you call the mother's or nurse's attention to the markings, she will tell you that they occurred when the child had such and such disease. And so the theory rests upon that foundation. We have to contend with facts which are stubborn things. I find, for instance, on the incisors as many as four or five distinct grooves. Suppose some one says to me smallpox was the cause of them. According to this theory a child must have the disease as many times as there are ridges and intervening grooves. On further investigation you find that the grooves are equidistant apart, showing that they occurred at exact periods of time. How do you account for these exact periods of time in the formation of pits and ridges? Why do they occur at such a period of time, and then no more? You must account for that. Another question: Why do these diseases manifest themselves in the enamel and not in the dentine organ?

DR. HARLAN: Because the enamel organ is developed from a totally different class of tissues from what the dentine organ is, and eruptive diseases affect that class of tissues.

DR. INGERSOLL (continuing): All tooth tissues are of dermal origin. The eruptive diseases attack the whole dermal tissue, and they are of a character as to penetrate deeply into the tissues, and must affect not simply that from which the enamel is formed, but also that from which the dentine is formed. The regularity in the form of ridges and grooves must be accounted for or else I cannot accept the theory. If children have smallpox, or any other eruptive or constitutional disease at regular intervals, that might account for it.

DR. I. P. WILSON: I cannot refrain from calling Dr. Inger-

soll's attention to a case he must have forgotten. Ten years ago when we were discussing this subject, I called his attention to the condition of my little boy, who was then about five or six years of age. I said to him, my child is now in perfect health and according to your theory his teeth will not be marked, as his system seems to be in a perfectly normal condition. But according to the usually accepted theory I shall expect to find upon his teeth when they are erupted well-defined marks from interrupted nutrition—for the child had passed through a serious protracted sickness two or three years before. And if I am not mistaken we agreed to make this something of a test case. He was at my house when the teeth came through a year later. I called his attention to the badly marked condition of those teeth, and the doctor had to acknowledge in that case that he was entirely mistaken in his theory. It seems to me the old theory is so well established as to be beyond question.

Dr. Ingersoll: I remember the case very well and the conclusion I arrived at under the circumstances. All of us know when a tooth is emerging the gum is slit and lies loosely over the tooth for months together. We must remember the fact that the tooth remains dormant at intervals so far as advancement is concerned, sometimes for one or two months, while surrounding tissues are being developed. One of the alternating tissues which is developed with the tooth is the alveolar process. During the period of growth of the alveolar process the tooth is dormant, because nature cannot supply all the material. She cannot supply lime salts for bone and tooth at the same time. During one of the periods when the advance of the tooth is arrested, while the gum is still slit and loose, there is time for the action of an eroding acid. This theory is both rational and scientific; while the other theory having no support of science cannot claim to be a rational theory.

Dr. Black: There seems to be in the discussion that which would leave the impression upon the minds of listeners that particular groups of diseases produced these markings. I wish to dispel that notion. It is true that Hutchinson has strongly maintained that these markings were produced by inherited syphilis, and that Magitot has contended that convulsions were the cause, and that this and that person has held that other diseases were the cause. But when we get down to the ultimate point we find one cause and one alone, that is depression of the vital powers. Par-

tial suspension of nutrition. I have followed this subject closely for twenty years among my patients, and I find all manner of causes if we observe the particular diseases. Only last summer a lady came to me with her child to know what I could do for the teeth. The incisors had come through very badly marked. I said to her, "your child was sick at a certain age." She said her child was healthy except that it had had a burn involving one arm and part of the chest at the age I mentioned, and was in a low state of health on that account. There was a mark upon the teeth corresponding to that age, and this was the only illness. And so I might go on and enumerate other causes. Typhoid fever is a cause in a good many cases, especially infantile typhoid, in that it causes a serious depression.

In regard to the dentine spoken of, it is marked in a good many cases. In many of the cases that show worse upon the enamel, they occur too early for us to find the marking much upon the dentine, but later we will find the markings upon the dentine in the form of rings and lines of interglobular spaces, such rings and lines as will cause caries to run in this or that direction and form very irregular cavities, evidently the same class of defects. Eruptive diseases are responsible for more of these than those causes that affect less prominently the epithelium. Why should these markings remain upon the teeth when they do not remain upon the bones, the flesh, and so forth? Simply because when enamel is laid down there is never a repair. As it is laid down it remains. So with dentine. The osseous structure is removed by absorption and new bone built in, so that any defects are repaired. So it is with all the other tissues except the tooth, therefore these markings remain as markings, showing the time of the depression. There may be depression this month, and another two months from now, and another four months, making a regular series, and occurring in some such order. It is not necessary for a child to have smallpox three or four times and measles five or six times, but any form of depression may account for the defect.

Dr. William O. Kulp, Davenport, Ia.: I did not think I would say anything upon this subject to-day, but as it is one that has interested me very much during my professional career, I can hardly refrain from taking part in its discussion. I have had certain experiences in my professional life, which have made me a firm believer in certain theories for the presence of these pits and

depressions of teeth. As an illustration, I will state a case: My first child had meningitis in the year 1864. She was then about eighteen months old. She came as near dying as anybody ever did and lived. Of course, I was greatly interested in the condition of her permanent teeth when they should make their appearance. When they came through, the central incisors from the marginal edge to the middle third, were in good condition. A portion of the middle third of the tooth was only about half the size of the balance of the tooth, with no enamel on it. The cervical third was normal. The loose calcification of the middle third was scraped off, giving the tooth an hourglass shape. The lateral incisors were deformed for more than one-third from the marginal edge of the teeth, one having a hole through the center of it. The first molar had about one-half of the grinding surface. The middle third was minus enamel and simply partially developed, while the balance of the same teeth were in perfect condition, the natural size, and covered with perfectly good enamel. And they are so to-day. I wrote to the late Dr. Atkinson about the case at this time. He induced me to bring the child to the American Dental Association at its meeting in Detroit (this was about twenty-four years ago).

The case was brought before the Association, creating considerable interest. The general opinion as expressed was: that these markings upon the teeth were caused by arrest of development, brought about by some crisis in the system, more than from skin diseases. This case showed very clearly the correctness of this conclusion. The tooth with a hole through it was filled by simply making a gold rivet of foil, reaming and enlarging the hole through the tooth, putting the gold through the hole and riveting it on both sides. She carried that until two or three years ago, when it was cut off, and a Low crown put on the root. The others I have removed all disintegrated enamed from, and polished the surfaces. The teeth to-day, are bright, smooth and hard, although without enamel. As I have previously said, the child had meningitis and there was entire suspension of nutrition. It was a clear case in which to observe when the teeth erupt, or when the calcification process begins.

Another word in the direction of answering Dr. Hewitt's question "What shall we do for our patients in order that their teeth may become harder and stronger?" This is a question that will

come home to every conscientious dentist. A few years ago, I rode the hobby of nourishing teeth physiologically. At the meeting of the American Dental Association, in Nashville, soon after the war, I read from a little book, giving statistics of the observations I had made upon the attempts in that direction, the press commenting upon what I read. It was not long after, that I received circulars from all the manufacturers of coarse and whole wheat flour; they even sending me a lot of specimens of their flour. Among those specimens, I selected one that I am still using at the present time. It is called whole wheat flour. I believe as firmly to-day as I did then, that it is possible to nourish teeth. I will just call your attention to an instance: We all know from experience, that our female patients suffer with their teeth more during the time of motherhood than they do at other times. One of my patients told me that she lost a tooth every time she had a baby. Those who care for the teeth of such patients know the anxious time comes when they are pregnant, because we know that at such times, our nice work in their mouths will suffer. I believe that that period can be gone through with, by using antiseptic agents as mouth washes, with nourishing food containing the lime salts, just as well as any other period in life. I have hundreds of patients that will testify to the statement that I made. I will speak of one family in particular, where the mother had thirteen children. During the birth of the first three or four children, the teeth were in bad condition, sensitive and soft. A great many of her fillings that reached above the enamel, were lost during the time of gestation. Her children's teeth were dwarfed and ill-shaped, the jaws contracted, with a tendency to irregularities. She was an intelligent mother, and asked me the question "why is it women have to suffer so many pangs and distresses and produce such deformed jaws as I do in my children, when otherwise healthy and intelligent?" I said, I presume the principal reason is, that our *first* mother went into a garden and ate an apple, and thereby broke a law. I think we might change the condition you refer to, by proper attention to diet. "Well," she said "give me any directions of diet, and I will go to the end of the earth, in order to accomplish what can be accomplished in this direction. I am certainly in great distress, for I know I shall have twenty-five children anyway and I want to save my teeth while in that business."

She was just the kind of patient to make experiments with. I told her to eat no white bread whatever; that the bread she eat should be made of the entire kernel of the wheat or rye. Next, eat all the potatoes she desired, and eat anything that grows under ground, for all of them have lime salts to a certain degree. Then to eat the cereals, peas, beans, rice, rye, barley and all the beefsteak she desired, especially the muscles of the beef. Masticate everything well, and for drink let it be water or milk, hot or cold as she preferred it. She adopted that diet, not only for herself, but for her family, and carried it out to my certain knowledge for fourteen years. The children that were born after that system of diet was adopted, were of an entirely different physical type from the four born prior to this diet. It is a little over thirty-three years since this occurred. The family since then moved to Chicago, and during a panic several years ago, the father lost his money, his mind and his life. The children born after the adoption of this diet, had proved themselves strong physically and mentally, stood the wreck and carried the shipwreck through, without breaking down; while those born prior to it, are loads on the others. I firmly believe from the records I kept of this family and close observation, that the change of diet was everything to them, both mentally and physically. Their teeth can no more be compared with those of the first children, than though they belonged to another family. One of them is now a young man. He has never had a tooth filled. He eats whole wheat bread, cereals, beans, rice, corn and things of that kind. He drinks water instead of coffee or tea. He is now twenty-seven years of age. It has increased their power of endurance; it has increased their stature and mental capacity, and certainly entirely regenerated the teeth. The mother during all this time never lost a tooth. She has a good set of teeth to-day, at an age of seventy years. The question was suggested whether the father should have the same diet. In this instance he got it.

Dr. W. T. Magill, Rock Island, Ill.: What was the diet previous to the change recommended?

Dr. Kulp: The diet of rich people.

Dr. Magill: They did not eat brown bread?

Dr. Kulp: Never had any brown bread in the house. They considered it uncouth to provide such rough food for their table. But, afterward the diet of the poor man was substituted. I know of a number of instances I might refer to, where mothers had diffi-

culty with softening of the teeth during the period of gestation; that after they had adopted the plan of sustaining the body with lime salts in food suitable for easy assimilation, and for building up waste tissue and the child, the sensitiveness ceased, and they went through that period very comfortably. I am satisfied that much can be done in the way of nourishing teeth physiologically, during the development of fœtal life, and in motherhood.

It is a little difficult to discuss these subjects with patients, for many of them have well matured ideas in regard to different kinds of diet, and unless you are posted upon the subject, you will soon be swamped. It is well to place ourselves in the right as to the causes of enamel deformities, before trying to explain them to intelligent patients. I think Dr. Black has struck the keynote upon this point.

Dr. F. H. McIntosh, Bloomington: I wish to say that I keep a limewater cruet on my table, and hope to benefit my daughter's teeth materially, who is very fond of sweets and fruits, by placing in her drinking water a teaspoonful of lime water. I expect good results from it, and I heartily recommend it to all who are raising a family.

Dr. J. J. R. Patrick, Belleville: I wish societies would adopt such a rule as they do in the British Parliament, namely, that a paper shall be read three or four times before it is discussed, so that the members shall have an opportunity of thoroughly understanding what the paper is, to prevent them from going off into tangents. I shall now attempt to follow them in closing. I simply rise in self-defense because I do not wish to be misunderstood. I do not want any one to go away under the impression that I am advocating irregularities and deficiencies from eruptive diseases—nothing of the kind. I simply mentioned three remarkable cases that might not occur in a lifetime of any man's practice.

They were peculiar. I attended both parents. The father is a physician and was one before they were married, and they have always thought a great deal more of me than I ever thought of myself, which is saying a great deal. (Laughter.) When the child commenced to erupt the first set of teeth they were terribly alarmed. I had to be called in, and the father supposed I had a remedy for it. I told him it was beyond my skill; that all he could do was to let them alone. I became interested, for the teeth were uniformly bad. I watched the deciduous teeth as they cut

through the gum, but there was no possibility to do anything for them. The gums were healthy, the teeth were bad, barely protruded through the gum and wasted away. This led me to inquire into the matter. Without knowing it before, the father told me that the majority of the children had scarlet fever. I got the time and date, as I generally do, the birth of the second child, etc. In the third case there were no such diseases to interrupt dentition. The teeth were all good. It is not a proof that scarlet fever and measles actually produced that condition of the enamel. It would have to be verified. We would have to get a large number of such cases in order to make it valuable from a scientific point of view. Merely the probability of that inference is what I refer to. I was very particular in speaking about all other kinds of irregularity, even in the most healthy condition of human beings, there is always a fault somewhere, and the anomaly is the perfect man. Recollect I said that these things are beyond the power of the dentist or the physician. There are forty-eight teeth in the progressive and retrogressive condition in the human mouth. The germ of the wisdom tooth is not present at the age in question. I merely mentioned the fact to show that the wonder would be that nature did her work as well as she did, not that she did it so poorly. I hope no gentleman will go away under the impression that I advanced the theory that fevers or eruptive diseases were the cause of defective enamel. I traced three cases in which fevers might have had an influence at the time when the enamel was forming. That is all. The other statements in my paper are correct, but the concluding portion of it in regard to fevers and bad enamel, requires a number of such cases, and it is difficult to get those cases when you are placed under the same conditions that I was placed.

I think it is beyond the power of either dentist or physician to regulate the form and character of the human teeth. When they are present you may change their position. When they are absent you may substitute others. If they are diseased, you may substitute material to take the place of that which nature designed originally. But that is all. There is a common saying that "There is many a slip twixt the cup and the lip," but there is more between the lip and mastication. There is still more between mastication and digestion, and infinitely more between digestion and assimilation. No man can say when he puts a cer-

tain thing in a human being's mouth that it is going to perform certain results. It is out of the question. The mere fact of there being forty-eight teeth in the jaws of a human being at one period of his life, a period characterized by progressive and retrogressive physiological process, is surprising, and the healthy individual is perfectly unconscious of it. It is like a good healthy stomach, you are not conscious of having it, and there are probably fifty different malformations of enamel that have no connection with eruptive fevers. Hutchinson never made his case good in regard to syphilitic teeth. He has not the data for it. He has not given the periods of the formation of enamel at the time that syphilis was present. Furthermore, there are many cases of secondary syphilis where the teeth are all sound and good. I have seen plenty of them. And so I hope no one will go away under the impression that I was advocating the theory in regard to the effect of eruptive diseases on defective enamel during the formative process. I merely cited three remarkable cases in order to arouse some interest in that direction, that others would do as I had done that had opportunities to watch and notice such cases, and report them as I have done. In that way we may build up some facts that will be valuable to our successors.

IMMEDIATE ROOT FILLING.

By Junius E. Cravens, D. D. S., Indianapolis, Ind.

"Is immediate root filling advisable :

1st. After heroic extirpation of live pulp ?

2d. After removing devitalized pulp ?

3d. After removing putrescent pulp ?

4th. Where there is a peridental membrane abscess, with fistulous opening ?

5th. The same, without fistulous opening ?

6th. What preparatory treatment should each condition receive, and with what material should roots be filled ?"

Surely, to answer all of these interrogatories would require an inspiration. Where is our Isaiah ?

To begin with, what is the purpose of filling a canal in a root at all ? The canal under consideration is, in a general way, an axial opening extending the length of the root of a tooth. When it contains a living, healthy pulp, practically it is a medullary canal. The pulp itself contains an arrangement of minute blood vessels, nerve fibers and absorbents, supported by connective tis sue ; in fact is an organ, or rather what is left of an organ that has been atrophied almost to extermination, by persistent self-sacrifice. I take it that if a pulp were permitted to finish the task it sets out to perform, there would eventually be no canal to vex or make us afraid. And how is this self-sacrificing process arrested ?

1st. By development of apical cementum, that so constricts the pulp at that point that its vital power is reduced, and the activity of odontoblasts is arrested. Thus the development of regular dentine is checked.

2d. By violence ; by external irritation ; by drugs applied to devitalize the pulp ; by death of the pulp from any cause.

3d. By "heroic extirpation of live pulp."

1.

In this third proposition we are brought to consider the first of the series of interrogatories under which this subject has been

presented by your committee. By "heroic extirpation of live pulp," presumably is meant the forcible dislodgment of the organ, causing vacation of a canal that already has caused more contention than the Suez canal, and that will continue to trouble long after De Lesseps' Panama ditch shall have been obliterated and forgotten.

What an awful responsibility your committee has assumed? But a live pulp has been pulled out, and what of it? A minute artery and vein has been snapped into, within, or just external to the apical constriction; naturally a slight hæmorrhage ensues, sometimes quite flooding the canal, rarely more than this. All hæmorrhages have an ending, and blood is easily removed, even from a root canal. What is to be done! Remove the damaging evidence of the blood-curdling tragedy. Dry the canal by any means you may see proper, and without more ado proceed to fill it with whatever material and by whatever method has been most effective in your hands. This done, your duty as a dentist has been performed. I can conceive of no possible beneficient effects to be anticipated from the introduction of medicinal agents into a root canal, once or twenty times following extirpation of a live pulp, unless, perhaps, for the checking of persistent hæmorrhage, a rare emergency.

To the first interrogatory I will answer, yes! and claim the privilege of explaining that I do not favor the practice of "heroic extirpation" of live pulps, consequently do not pursue it.

2.

"Is Immediate Root Filling Advisable, After Removing Devitalized Pulp?"

To devitalize a pulp, an application is made to the organ, or in close proximity to it, of some medicinal agent that first arrests circulation within the pulp; stasis is established and death ensues. If removal of the pulp is practiced before putrescence obtains, it must be accomplished by practical extirpation. In this connection I can discern no material difference between a canal that has been vacated by extirpation of a live pulp and one by extirpation of a devitalized but non-putrescent pulp. To the patient the difference may be very marked, but to the operator practically none.

In the removal of a devitalized but non-putrescent pulp the

same apical hæmorrhage may be observed to follow as in extirpation of a live pulp. The separation of the dead from the living within, or at the apical constriction, may be attended by apparently the same degree of pain in both cases; but the introduction of a broach into, and its passage through the devitalized but non-putrescent pulp, while occasioning some pain, is far less painful than the penetration of a live pulp to an extent essential to accomplish extirpation.

Usually I find no occasion for extirpation previous to incipient putrescence unless there shall present an emergency. This subject as presented by your committee does not call for a discussion of emergency measures. My position then as to the second interrogatory is that the removal of a devitalized pulp that is non-putrescent leaves the canal in practically the same condition as after extirpation of a live pulp; therefore, my practice would be precisely the same as to the immedite filling of the canal.

3.

"Is Immediate Root Filling Advisable After Removing Putrescent Pulp?"

Now may all saints and phagocytes defend me; for as I wade the water appears darker, deep and dangerous. What is a putrescent pulp? In short, a dead pulp in which decomposition has begun. By decomposition there is watery degeneration of a pulp, and generation of sulphureted hydrogen within the cavity occupied by the pulp.

What effect such degeneration can have upon the surrounding dentine, I am at a loss to discover. Often we observe that pulps have died from some unknown cause and given no sign. Evidently in such obscure cases the usual course of decomposition must have transpired; the complete maceration of tissue and final resorption effectually removed all traces of pulp, and we found the canal empty, even dry and almost inodorous. In such cases the tooth has perhaps retained a natural color; no fistula indicates abscess; all outward appearance indicates a live, healthy pulp. It is useless to speculate upon what becomes of the gas and macerated tissue in such a case. Does it disappear in the surrounding tubuli? If so, why does not discoloration of dentine ensue? But Professor Miller of Berlin, says in effect, that the tubuli retain their original organic contents after death of a pulp, and are not accessible to anti-

septic fluids introduced into the canal. If this be true, why should the tubuli be permeable to the fluids resulting from decomposition of the pulp in the canal? And suppose, for sake of argument, that the water of decomposition may be, has been absorbed by tubuli; what has become of the sulphureted hydrogen also generated in the canal? Does any one suppose that the gas has also been absorbed by the little tubes? And if the sulphureted hydrogen were so absorbed, is there any medicinal or purely chemical agent that can be applied for the removal of the gas from dentine? Iodoform may be introduced into a canal and cover up the odor from sulphureted hydrogen, because iodoform can outstink any gas under the sun.

A platinum wire may be introduced into a canal and heated by electricity; a very effective way to dry the walls of the canal, certainly; but the odor of scorched bone is scarcely preferable to sulphureted hydrogen emanating from a pulp canal. Any solid substance introduced into a canal would displace any gas found there; the platinum wire would do this without being heated, but the odor would remain. The odor of sulphureted hydrogen will cling to a glass tube through which it has been passed. After all, what deleterious effects are to be anticipated from the odor that clings to the walls of the canal from which a putrescent pulp has been removed?

After removal of a putrescent pulp, I would dry the canal and immediately and permanently fill it.

4.

"Is Immediate Root Filling Advisable where there is a Peri-dental Membrane Abscess with Fistulous Opening?"

On this point permit me to quote from an essay on "Management of Pulpless Teeth," read by me before the Ninth International Medical Congress, Washington, D. C., 1887. "A fistula may be depended upon to accomplish all necessary drainage of pus from the cavity of an abscess after closure of the apical end of the pulp canal. When no more pus shall be formed, the fistula will disappear for want of exercise." "A fistula is the dentist's friend and best ally; it accomplishes drainage of pus and thus relieves the pulp canal of a pernicious service." "A fistula from an alveolar abscess should never be interfered with in any direct manner, but should be encouraged to perforn its good offices, and will certainly disappear when its task is done."

In answer to the fourth interrogatory, I hold that immediate root filling is advisable where there is abscess with fistulous opening.

5.

"Is Immediate Root Filling Advisable where there is a Peridental Membrane Abscess without Fistulous Opening?"

If I correctly comprehend this interrogatory, it refers to what is commonly termed "blind abscess." The darkness of the design of your committee has become truly Egyptian; oh, for stronger spectacles.

Be kind enough to indulge me in another self-quotation bearing upon this point: "Diagnosis of blind abscess of alveolar process is largely guesswork, because the single item of a wet canal does not prove the presence of pus, nor the existence of an abscess cavity. When blind abscess exists, the accumulation of pus is so very slight that it will cease altogether after the cause has been removed by closing the apical end of the pulp canal. In nearly all such cases, prompt closure at the apex will be followed by no noticeable inflammation, if proper care be observed in manipulation within the pulp canal."

In all cases "the apical end of a pulp canal should be permanently closed as soon as the canal is *laudable*—that is to say—as soon as *free from pus* or other fluid, and *all obstructive matter.*" "*A clear, clean canal is always laudable.*"

In reply to interrogatory five, I would remove all obstructive matter from the canal, absorb moisture from it until no more appears, and immediately permanently fill the canal, feeling assured that the operation "will be followed by no noticeable inflammation," if proper care has been observed that nothing has been forced from the canal through the apical constriction.

6.

As to the sixth interrogatory, I have given *ad seriatum* my opinion as to "*what preparatory treatment each condition should receive,*" and in closing with consideration of "*with what material should roots be filled?*" will state that I am a stanch believer in the efficacy of gutta-percha dissolved in chloroform, or what is better, a thin batter of oxychloride of zinc, either to be forced home with gutta-percha points. As a precaution against either preparation mentioned being forced through the opening at the apex of the

root, if a canal is fairly penetrable I first close it at the apical constriction with a slender ribbon of thin tin foil.

If a canal is too narrow or tortuous for free manipulation, I omit the tin ribbon, and trust to careful manipulation to avoid forcing the gutta-percha solution or oxychloride batter through the apical opening. *Beyond the apex—danger lurks.*

I hold that immediate root filling is advisable, and am content to leave measures and materials to men.

DISCUSSION.

Dr. A. W. Harlan, Chicago: In looking over the programme I saw to my surprise that no one had been appointed to open this discussion, and I have not prepared myself for this task. I do not know how many years the discussion of the filling of roots will consume in the future, but I suppose that a few of us will fill the roots of teeth immediately, and a great many of us will not.

As to proposition one, I do not see that there is any particular objection to filling the root of a tooth after heroic extirpation of the pulp. I do not see any objection to filling the root of a tooth after removing the devitalized pulp without putrescence. I do see objections to filling the roots of teeth immediately after removing putrescent pulps. When a tooth pulp is destroyed or dies without the aid of a medicinal agent, the animal contents of the dentine of the tooth die also. I do not think any microscopist has ever been able to demonstrate life in the dentine of a tooth after the death of the pulp. In the process of destruction of a pulp through the agency of micro-organisms, sulphureted and probably phosphureted hydrogen are both evolved. The dentine of a tooth will certainly be able to take up a certain quantity of both these gases, otherwise there would be no smell of the dentine of a tooth beyond the surface of the pulp canal. Every one practicing dentistry must know that prior to reaching the pulp chamber after the pulp is dead, that the odor of suphureted hydrogen has appeared to him noticeably at some distance from it. This would absolutely prove the diffusion of the gases of decomposition throughout the dentine. Instances are not wanting to prove also that teeth have been split after the death of the pulp from the expansion of gases. I remember several instances of that kind. The question for us, however, is whether these gases are deleterious or not. It would take a longer essay than I can condense into a few moments to give all the

reasons why the gases that are displaced by a platinum wire or any other instrument are not wholly displaced from the interior of the dentine. There is one thing very certain, and that is this: That after the filling of a root of a tooth, no matter how perfectly it may be done, without any preparatory treatment other than the purely mechanical, that that tooth will afterward be a lame tooth; that it will be subject to elongations, and it will be a tooth that is not entirely comfortable to its possessor. There is one possibility perhaps of that not being always true, namely, the possibility of the encystment of the apex, and still that would not always be a bar to the future weakness of the tooth. Of course, if putrescence has only begun the poisoning of the interior of the dentine would be very slight, and it is so easy to neutralize or nullify such a poison before filling the root, that I should say that that was certainly very desirable. I believe I would even consider that it would be better to use hot water in a case of that kind than to use nothing, because in that way we might get rid of some substances that might be soluble in water and thereby prevent further impairment of the tooth.

As to the question of treatment of pulpless teeth having an abscess and a fistulous opening, I shall not dwell particularly upon that except in this respect, that the soaking of the interior of a tooth with any medicinal agent certainly does not cure the abscess. That is not the object of introducing an agent of any kind, even water. The object of using water, sulphureted hydrogen, or Labarraque's solution of chlorinated soda would be for cleansing purposes. The introduction of an agent that would have a tendency to neutralize any of the cadaveric alkaloids that might be stored in the dentine explains itself. That is why they are used. After that has been accomplished, I do not see any object in waiting, before filling the root, unless there is some mechanical reason.

The fifth proposition. Is immediate root-filling advisable where there is an abscess without a fistulous opening? I should say decidedly no. A great many cases of pulpless teeth, where there are no fistulous openings, are really encysted, and the only way you can be absolutely certain of that is to adjust the rubber dam before they are drilled into. You all know this. Absence of odor and moisture and the preservation of color will usually determine almost infallibly that there is encystment of the apex. It would be perfectly safe to fill such a root at once, but if there is

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pus or a watery discharge you can fill the root if you like. I will not. I will not do it for this reason: I do not like to convert a simple, innocent, cold, blind abscess of that character into an acute volcanic eruption which I may not be able to control. The disastrous results following the indiscriminate filling of roots of that kind have been too numerous to permit me to indulge in that sort of pastime. I have seen a set of teeth from the second incisor to the second molar loosened in their sockets, alveolar processes necrosed and removed, resulting from the filling of roots under such circumstances. I have seen that from other conditions, but this condition is mentioned particularly. That is one place where the evolution of sulphuretted or phosphureted hydrogen and deposition of leucomaines and ptomaines and cadaveric products is more likely to become thoroughly infiltrated into the dentine of a tooth, and these must be driven out, and you cannot drive them out with water or instruments, or with a platinum wire with an amount of heat that is safe to introduce into the root of a tooth. How many degrees of heat are necessary? Probably not more than 300, and that has been demonstrated to be ineffectual as a destroyer of the micro-organisms themselves, or their spores that might be present in such a situation. That is one place out of the five I should say where great care should be exercised in the preliminary handling of roots of teeth. It is one place where I always fear to set up the inflammation that I have spoken of and described as "volcanic." No one can foretell the size of the excavation beyond the apex of the root, because it is impossible for him to see it. But in going through the dissecting room, as I have done a good many times, where the heads of subjects are being dissected, I found a great many excavations of that kind, and I was astonished at the size and the irregularity of such caverns. In looking over the skulls that are in the Peabody Museum, I found a great many cases where the Indians and Peruvians must have suffered from blind abscesses, and from a not too hasty, but somewhat critical examination of these skulls and those in the Army Medical Museum, I came to the conclusion that it was rather a risky procedure to fill the roots of all such teeth immediately, even though dryness were secured, from the probable future distress that the patients would have to endure. That is one of the class of pulpless teeth that I should think required great discrimination in handling; and the ones with the actual blind abscesses and the actual

pouches beyond the apices of roots must be disassociated from those where there is encystment of the root. I think the dental profession is rapidly growing to that degree of knowledge where they can take the necessary precautions to assure themselves that all pulpless teeth without fistulous outlets do not have a blind abscess beyond the apex of the root.

With reference to the final and concluding portion, it seems what I have to say with regard to any preparatory treatment is that my idea of root filling is something like this: that it should be something that would fill the root in the best possible manner, that it should not depend upon the incorporation of any drug of any kind to assure its permanency, that it is not a necessity if the root is ready to be filled to have a root filling that possesses any antiseptic or disinfectant properties. If it thoroughly and mechanically fills the roots that is all that is required. Abscesses should be cured before the roots are filled, especially blind abscesses.

Dr. G. V. Black, Jacksonville: I will say but a few words. There are two things necessary before any root is filled whatever may be the conditions. One is that it is mechanically clean, the other, that it be surgically clean. When this is accomplished generally the root may be safely filled. We cannot have a root surgically clean so long as pus is drooling into it at one end, therefore it cannot be ready to fill with safety to the patient. There is just one difficulty in the handling of this matter, in talking about it, and in giving rules. It is true that a very large majority of the cases with which we meet may be so clean and so handled as to make fillings at once safely, that is, such fillings do well. While this large majority do well, there are continually coming into our hands those cases that will not do well, but will give rise to those eruptions of which Dr. Harlan has spoken. Now, evidence of skill in the dentist is not a success with those large majorities especially, but it is his success with that minority which will give trouble to the patient if not very skillfully handled.

Dr. Edmund Noyes, Chicago: When we have pulpless teeth in our hands to treat, we have a condition of disease, and it seems to me that it is a pretty good general rule to see the disease cured before we finish the work and dismiss the patient. That is a proper basis upon which to argue the question of immediate root filling.

In regard to three or four of the first conditions, the question of immediate root filling is ordinarily not one of practicability, but of convenience, of safety, of the procedure which will be followed most certainly by comfort after the operation, and when a living pulp has been killed and extirpated, about the only objections to immediate root filling are the questions of subsequent exudations which might give rise to some peridental inflammation if denied a free outlet, and what is of quite as much importance, the question of the painfulness of the operation at the time. My own experience has been that roots at that time are often painful under the introduction of a filling which would not be so a week later, and the question of comfort during the performance of the operation comes in. It is not a question essentially of the success and possibility of the operation, but it relates to convenience, practicability and comfort.

In regard to the case of an abscess with a fistulous opening, it seems to me that if the interior of the tooth has been taken care of thoroughly, as Dr. Harlan has suggested, that then the question of further delay in the root filling, relates chiefly to the access for treatment of the abscess cavity. Sometimes it can be managed more thoroughly and conveniently through the root canal, sometimes it cannot. After a thorough disinfection of the tooth, its canal, and the tubuli of the dentine, then the question is one of convenience and perhaps of necessity relating to the treatment.

In discussing blind abscesses, I noticed that the essayist did not make a very sharply defined distinction between the cases which Dr. Harlan spoke of as encysted, in which the decomposition of the pulp has been slow and the pulp canals are found empty, dry and odorless, the other condition in which the pus present is derived only from a suppurating pulp, and those in which the pus comes from an abscess in the apical space, discharging, if at all, through the root canal of the tooth. The last of the three is the only one that can be called a blind abscess. The treatment in these varying conditions will be as different as the conditions themselves. Just here, I will say, it seems to me that the assumption that the first case; of encysted roots in which the pulp canals are often empty, dry and odorless, can hardly be spoken of as cases in which decomposition of the pulp has been attended by the formation of sulphureted hydrogen. When such a condition is found it is in a tooth not decayed, or one in which the pulp-cham-

ber is not opened. Decomposition of the pulp in such cases is not dependent upon putrefaction. It must be much slower, for it has often taken place without any appreciable disturbance of any sort. It is probable that it has taken place without the agency of micro-organisms; at any rate, the nature of the destruction and the agencies that have produced it, must be different from what they are when the pulp dies from exposure and goes through the ordinary course of putrefaction. If there is a blind abscess and the destruction of tissue and formation of pus considerable, as is the case in numerous instances, the only outlet for the abscess being through the root canal, we must either leave it open for our medicinal treatment, or make another through the gum and alveolus, or close the root with the probability that there will be the volcanic eruption spoken of, and the formation of a fistula by nature's effort. A great many of these cases can be treated by means of diffusible, noncoagulants so as to heal without any serious disturbance, which would surely take place if they were filled at once.

Dr. Geo. D. Sitherwood, Bloomington: I had the pleasure of hearing the essayist advocate some of the same views at the International Medical Congress in Washington City, in 1887. I was at that time more of an advocate of immediate root filling in my own practice than I am at present. I cannot agree with the essayist in the third proposition which relates to blind abscess. Dr. Harlan has so well expressed my own views with reference to those conditions that I will not repeat them. I heartily coincide with his views as stated.

Dr. Black has said that the root canals must be surgically and mechanically clean. The length of time that it takes in everyday practice in many of these cases to get the root canal thoroughly cleansed mechanically and surgically is in very many cases impracticable unless you could throw sunshine into them for a couple of hours. It is therefore better to take more time and use such agents as peroxide of hydrogen and eucalyptol, to get the canal thoroughly cleansed. Five or six years ago when I advocated immediate root filling, I had a few cases in my own practice of "volcanic eruption," which convinced me that there was a better and more scientific method. I do not advocate immediate root filling in cases of the kind referred to.

Dr. I. P. Wilson, Burlington, Iowa: I was deeply interested in the reading of the paper. It is a very commonsense production, and

the few points that arose in my mind while the paper was being read have already been dwelt upon by other speakers, so that I shall say but a few words. I am in perfect harmony with most of the views expressed by the essayist, and have been congratulating myself and the profession that there is so much unison in our methods of treatment. It indicates that our practice is successful and scientific. I must say, however, that I am not at all prepared to regard with favor Dr. Cravens' recommendation to simply cleanse and dry root canals thoroughly, and then fill without any medicinal treatment. I believe that drugs are used too freely in the treatment of root canals but I am not prepared to entirely abandon their use.

Dr. L. C. Ingersoll, Keokuk: In entering into an intelligent discussion of this subject a few facts must be kept constantly in mind. The first great fact is that of disease. The next point is that the cure of disease is in nature—the *vis medicatrix naturæ*. Take the case of a putrescent pulp. The disease is not in the putrescent matter. That is dead matter and gone; disease occurs where that matter comes in contact with the living tissues. So by the removal of the putrescent matter you have not cured the disease. In the case of a living pulp which the dentist decides to extirpate, by the act of extirpation of the pulp, at the point of separation of the living tissue there is created a disease by the wound. Extraction of a tooth may cure the disease of the pulp, but another disease is created by the wound. So in extirpating a pulp a cure implies healing of the wound created by the act of extirpation. Immediate root filling may present the proper treatment. There is a very delicate question beyond that. To what extent can we rely upon nature in accomplishing a perfect cure? That is a very important and delicate question, and I do not know that it can ever be decided. When you use the word "cure," it is very indefinite. Did anybody ever get cured of a disease? There is an old maxim in surgery that "once a lesion always a lesion." The fact that probably every man in this room is carrying about in his body an organic disease of some form, ready at any moment to spring into activity is evidence that we do not have many *cures* of disease. The fact that so many teeth are treated according to rules of science and yet remain sensitive and troublesome at times is evidence that they were not thoroughly cured. It is true that relief is afforded, but that is all you can say of it. Those who

have heard me talk on this subject for the last ten or fifteen years know that I have not much faith in immediate root filling in the class of cases referred to. I do not believe in such a thing as mechanically extirpating a pulp. I do not think it can be done. You can extirpate or remove portions of the body of the pulp, but the pulp, the processes in the dentine are there yet. Whatever method one may practice, in the remaining portion of it there is a wound, great or small, created. It must be healed. If it is thoroughly healed you have a perfectly sound tooth possibly, and yet when I use the word "perfectly," there is very little of it. Allowance must still be made for imperfection. Relief is afforded, and the patient may get along well with it. After all there is a little twinge occasionally which reminds a patient that it is not a perfect tooth. There is no possibility of extirpating the pulp fibrils mechanically and no possible way of filling a root immediately without more or less danger of serious consequences beyond. The most thorough method of extirpating a pulp, fibrils and all, is to allow the dead matter to decompose. This takes time. If you close it up in the tubuli of the dentine it will cause sensitiveness of the peridental membrane. If the dead organic matter remains in contact with living tissue it is a source of irritation. If it is allowed to decompose and pass off in gases, you *may* then *possibly* enter the tubuli with some of the attenuated substances which we use, such as wax, paraffine, gutta-percha, or something else, yet it is an extremely doubtful thing. Atmospheric air enters the tubuli when the pulp fibers vacate. If air goes into the tubules of the dentine I believe it is a doubtful thing whether wax or anything else can be forced in. You talk of *how* you do it, but we want something more than words to force it in there. I doubt if there is any such thing as filling the tubuli of dentine. I have not much confidence in the statements of any man who says he has done it. When I consider the facts of chemistry and that everything must harmonize with them, I cannot make out the harmony. I wish I knew *how* to fill the tubuli of dentine permanently. A man may think he does it and say it over and over again. I presume there are as many as fifty different kinds of preparations used for filling the roots of teeth, yet the profession is not agreed on any of them. If there is anything certain about any one preparation, we ought to agree on it and follow it. I do not know of anything better than to do the best we can and trust to nature to do the rest, but how far I do not know.

The word "mummifying" ought to have been abandoned years and years ago. There is no such thing as mummifying a pulp. You may mummify a ham, but how soon will you have decomposition. In regard to the tissues, they may be mummified for the present, if nature gets rid of the decomposing elements there may be comfort for a number of years. Some dead pulps are never extracted, and yet never give any serious trouble to the patient. I look upon immediate root filling as blocking all the chances I have of after treatment. If my case is one in which I have little doubt concerning the fact of thorough extirpation and wish to introduce a medicament, if I plug that root up I cannot effect a cure after that. I might enter it externally, but that is uncertain. The only certain mode of entrance is through the root canal.

Dr. Cravens (closing discussion): I think that some of the gentlemen did not understand exactly what I meant when I said that before removing a pulp that has been devitalized, I prefer to wait for incipient putrescence. I hope they will not labor under the impression that I think there is any particular virtue in putrescence, even in the incipient stage. When a pulp dies, I have noted as a first effect that circulation within the pulp ceases; there is no hæmorrhage; the vascular system within the pulp is apparently dead. Even after this has taken place I have observed that the nerve fibrils in the pulp retain their sensibility too much to be comfortable to the patient in removal of the pulp at that time; even if stasis has reduced the pulp tissue to the condition of beefsteak, the annoying sensibility will continue. I believe that as soon as incipient putrescence prevails, the nerve fibers in the pulp lose their sensibility; and that until incipient putrescence prevails sensibility of pulp will also prevail. That being my idea I prefer to wait until there is incipient putrescence before attempting removal of a pulp.

Usually, a blind abscess will be able to discharge its store of pus through the pulp canal; we know that the canal is constricted at the apex, but not always to a minute caliber, the amount of drainage that takes place through it is necessarily small. Probably it would amount to nothing if no pressure were behind it; when that pressure is removed the drainage will stop. I think that if a blind abscess is able to discharge all of its pus through the pulp canal, it must be a very small abscess, and the amount of pus

production is minimum; the abatement of the cause in the canal will stop the formation of pus.

If I correctly understand the substance or sense of a paper written by Dr. Miller of Berlin, and published in the *Dental Cosmos* sometime during last year, he speaks of a cemental lining of pulp canals. The subject of that paper was revamped by Dr. Barrett in the *Advertiser and Practitioner*, in a commentary in which Dr. Barrett took the ground that whatever might be said by Dr. Miller upon that or any other subject must be accepted as correct. Dr. Miller said in substance that the organic contents of the tubuli, after the pulp dies, become mummified, notwithstanding Dr. Ingersoll says there is no such thing as mummification. Dr. Miller said it is the best possible condition for the tubuli to be occupied by the mummified fibrils. I am not defending Dr. Miller's position at all, I am quoting it. It is better to let the mummified matter alone; anything that chemical agents could do would not improve this or remove it. Dr. Miller insists that the cemental lining of the pulp canal practically closes up the mouths of the tubuli, so that they are not penetrable by medicinal agents. However we know that sections of dentine can be colored for microscopical investigation.

In regard to Dr. Black's minority; he has divided immediate root filling cases into majority and minority, admitting that the large majority are successful, as I understood him; he has my thanks for the admission. He did not state what the majority is, consequently we do not know what the minority is; close observation for twelve years leads me to estimate the minority at ten per cent. There is no political party under the sun that cares a rap for a minority that represents only ten per cent.

Dr. Noyes said that there is disease there if there is death of the pulp, and that something must be cured. Very good. If the pulp has been removed, the corpse has been carried out. If the patient is dead is he diseased?

Dr. Harlan: You would have to disinfect the room, then.

Dr. Cravens: (continuing) In regard to gases penetrating the tubuli after death of the pulp and the canal is subsequently filled, and later there is a lengthening of the tooth, as mentioned by Dr. Harlan, I suppose he refers to pericementitis. If the gas has entered the tubuli, and subsequently the canal has been adequately filled, it seems to me that the gas has been effectually

imprisoned within the tubuli; I am at a loss to understand how the imprisoned gas within the tubuli can later produce pericementitis, or the inflammation that is manifested by the apparent lengthening of the tooth.

When Dr. Sitherwood began his remarks I thought I had found a convert. I am sorry he has retrograded so far since 1887.

Dr. Ingersoll's remarks remind me of the old adage that "An honest confession is good for the soul." The gentleman insisted upon the treatment of the canal for conditions that I cannot conceive to exist—a supposed condition beyond the root perhaps, or, as he said, within the apical constriction or attenuated part of the root—that could not be cured. If it cannot be cured, why should we waste our time trying to cure it? It reminds me of a song I used to hear thirty years ago. The poet, in addressing his friend and telling him about a recent visit to the scenes of their boyhood, their early homes, the old schoolhouse, and lastly the ancient church where they used to go to sleep every Sunday, says:

"The same old bricks are in the walls,
The bell swings to and fro;
And the music 's just the same, dear Tom,
'Twas twenty years ago."

RECENT ADDITIONS TO THE THERAPEUTICS OF PYORRHŒA ALVEOLARIS.

By A. W. Harlan, M. D., D. D. S, Chicago, Ill.

In considering some of the therapeutic measures to be utilized in the eradication of pyorrhœa alveolaris or the correction of loosening of the teeth, the mind of the operator naturally concludes that the teeth have been firmly banded, wired or fixed in place, so that they will not be swaying to and fro like the branches of a tree in the face of the wind. A presupposition will also include the detachment of sanguinary or serumal deposits, their removal from the pockets, and the perfect cleansing of the pockets with a solution of sodium fluosilicate in water, 1 to 155. This solution is in most cases followed by the injection of an 8 per cent solution of sozoiodol which is dissolved in water. Now, if the operator desires to get the benefit of nascent iodine the injection of a very small quantity of pyrozone or hydrogen peroxide will liberate the iodine which will permeate the recesses of the pocket. It is not for a moment to be thought that the writer has abandoned peroxide of hydrogen, because it is used frequently for cleansing purposes, but some experiments with alkaline solutions, boro-glycerine in water, boric acid water, c. p., one to twenty-five, and sodium fluoride in water, one to three hundred down to one hundred and fifty-five, have convinced me that in the beginning of the treatment they are more valuable as cleansers than they have been thought to be. The products of the microbes in the pockets where pus is found are almost wholly acid in reaction, and an alkaline solution will be generally indicated instead of one acidulated. Later, in the management of such cases, stimulating, acidulated and astringent injections are a necessary adjunct in the control of the production of pus. We have been singularly fortunate in the last year or two in the general introduction of the trichloracetic acid, alumnol, and the combination of dilute sulphuric acid, dissolved in cinnamon water. The various pyrozone solutions are the relatives of hydro-

gen peroxide, and as such are to be used in the places where peroxide of hydrogen was formerly indicated. The particularly valuable drug in the newest list is trichloracetic acid in varying solutions from one-half of one per cent to six or eight per cent in water. This is a most valuable astringent, stimulant and refrigerant. Its germicidal value consists in the complete destruction of the organisms found in pyorrhœa pockets. In a period of less than two minutes all movements will cease when one-half per cent solutions are used, and as even stronger solutions are required, we generally use double or quadruple this strength, it may be considered a positively effective germicide. The drug is used every other day or once in three days. When a powerful astringent is needed, one that will penetrate, an aqueous solution of alumnol is indicated. It has the property of coagulating, then dissolving the coagula and penetrating still deeper and reforming a coagulum, and at the same time it is a stimulant and germicide. It is soluble in water up to forty parts in one hundred. I generally use about two to seven per cent solutions, seldom stronger, although experimentally I have used solutions up to the limit of solubility. In such cases—very desperate ones—one application will be found sufficient. Much discrimination is needed in the treatment of cases of loosening teeth, for instance in the general wasting of the alveolar process and recession of the gums without the sanguinary deposits on the roots. In such cases it is best to begin with from one to two per cent of sulphuric acid dissolved in cinnamon water for four or five visits at intervals of three days between each visit. I recommend a dentrifice during this period composed of

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Sodium flouride, gr. c.
Prepared chalk, ℥j.
Powdered orris root, ℥ij.

perfume with an esssential oil to suit.

This treatment is followed by, say, at the end of fifteen days, with injections of two to six per cent of sozoiodol for a month, once every three or four days. When desired, a small quantity, one drop of the solution is injected into each pocket. If the gums are much thickened, with blunted septa, they are painted with a solution of iodide of zinc, twelve grains to the ounce of water, always carefully drying them before using the solution. When a case is presented in the acute stage, a paste composed of iodol and cinnamon

oil is used, gently rubbing it into the pockets with a thin spatula; when much pain is present, I use as an injection into each pocket the following:

℞

Melted carbolic acid,	*m.*	xl.
Eugenol,	*m.*	xxx.
Hydrochlorate of cocaine, (4% sol.)	*m.*	l.
Boracic acid,	gr.	lx.

At first the solution will not be clear, but after a time it will become homogeneous. One-half to one drop in a pocket will arrest the pain. Usually there are not more than three or four pockets to be treated under such circumstances, and there will be no particular soreness follow such an injection. This is not to be repeated unless there is great pain.

In rheumatic subjects, I have found from five to ten grains of iodide of potassium in peppermint water, after meals for a week or two, will materially aid the local measures. All cases of loosening where there are serumal deposits, are much benefited by using trichloracetic acid in water up to six or seven per cent injected into the pockets carefully with a gold, glass or platinum pointed syringe. An interval of one to two weeks is allowed to elapse from time to time in the treatment of all cases, without any care save cleanliness and massage of the gums by the patient himself. This will be found of decided utility when the tissues become, so to speak, habituated to the introduction of medicines. I need not emphasize the uselessness of attempting to save all loosened teeth as there are some from their location and the occlusion that no treatment will save permanently. This matter of extraction must be decided by the dentist without delay as the attempt to save a tooth already hopeless is only a waste of time, and it may endanger the future stability of others not much affected. The destruction of a pulp of a tooth is often indicated when it is inflamed from the depth of a pocket, alongside the root of a tooth. Many cases that are so stubborn that they will not yield to local treatment, are promptly relieved by the filling of a root and the continuance of the previous line of medication. I do not urge the unnecessary destruction of the pulp of any oral tooth, so it will cause disfigurement but great care must be exercised in the selection of cases, with the happiest results, should no mistake be made in the outset. If the patient in any case is found to be a mouth-breather, a rhinolo-

gist should be selected to correct this habit if it is possible to do it. Enlarged tonsils and a thickened nasal mucous membrane must be gotten rid of in some manner before the protrusion of the teeth can be arrested. Probably the greatest number of deformities in the protrusion of the six anterior upper teeth are produced by mouth breathing, aside from the loss of the inferior molars, allowing the inferior incisors to strike against their lingual surfaces. This latter case being purely mechanical, the fitting of teeth or bridges to supply the loss of molars is indicated as a means whereby the protrusion can be arrested. The whole *modus operandi* of treatment of loose teeth requires much patient study and the adaptation of every aid to secure any degree of success, therefore I urge upon you the absolute necessity of studying each case before laying out a line of treatment, as no well-defined plans in advance will cause much subsequent trouble and the probable loss of many teeth which might be saved had thought been bestowed upon the case in the beginning.

DISCUSSION.

Dr. G. Newkirk, Chicago: Mr. President, in my opinion the selection the committee made of the one to open the discussion on this paper has been unfortunate, because I have not tried many of the new remedies mentioned by Dr. Harlan. The best we can do, probably, is to await the publication of this paper and then study it carefully. I would suggest that it has the merit of brevity almost to a fault, and that some of the interjected explanations which the doctor has given us it would be well to incorporate in the printed paper. Carefully studied, the paper will be valuable to us for practical reference.

I was glad of the mention he made of several things aside from new remedies. The first is the necessity of fastening the teeth to prevent them from moving about. That is something which is entirely too much neglected in our practice. We undertake to treat cases when the teeth are loose and movable by forces brought to bear upon them constantly by the tongue and lips, and during mastication. It is an easy matter to fasten them by wiring, or by making gold bands and soldering them together and putting them on with a little cement, because these loose teeth with which we shall have to deal are usually in front. As a rule these little bands

or wires are easily adapted, and their employment should not be neglected. We cannot expect to treat such cases successfully by any method, new or old, unless we adopt necessary mechanical support.

I was glad to hear Dr. Harlan mention also the necessity of a tooth powder for the patient himself that should possess prophylactic qualities. I have been in the habit of prescribing for my patients a tooth powder for daily use containing borate of soda. I also prescribe a solution of tannin in glycerine, which the patient, after drying the gums, applies with the cotton or sponge which I give him. Usually the cotton can be wrapped on the end of a wooden toothpick and the application made by the patient himself, after rinsing the mouth with hot water or some antiseptic wash.

I wish to emphasize the necessity for extraction in some of the hopeless cases. For example, you have one in which perhaps six or eight teeth are involved, with two or three hopelessly diseased. The extraction of these two or three will greatly facilitate the successful treatment of the remainder. I have had cases wherein I was almost in despair of success, but by sacrificing the worst, was able to save the large majority and put the mouth in a healthy condition. There are surgical principles involved here which I think we are apt to lose sight of, that of drainage. It often happens that the alveolar walls between the teeth are broken down, and there are numerous points of ulceration which are hard to reach. There are also carious portions of the alveolus which we would do well to remove, but fail to reach. By removing the very loose teeth in some cases we succeed in getting drainage, and seemingly a new vital action in the parts. As the doctor says, in order to treat these teeth properly the root canals should be opened and filled, where we may reasonably suspect the presence of a dead pulp with or without an apical abscess.

I was pleased with the observation that we need to study each case, and that no iron-clad rules could be laid down for treatment. It is a principle which holds good all through the practice of medicine, and all of our special work. We are quite apt to suppose that by some routine practice in the treatment of diseased conditions—by the use of some special remedy or combination of remedies we can succeed, while the fact is we have to study the conditions involved in each case—the constitution of the patient, the previous history as to health, the condition of the blood itself, the tempera-

ment, and the condition of the parts. Everything has to be taken into consideration. Hence the necessity of close and careful observation, and noting down what we see. It enables us not only to make diagnoses correctly, but is all important for successful treatment.

Dr. Black: I do not know that I ought to take up the time of the Society in talking on this subject, but as my name has been called I will say a word or two. I do not know whether members of the dental profession have yet fully realized the good that theymay do their patients by a close, careful study of these diseases and the modes of treatment that have been developed thus far. You will notice from what Dr. Harlan has said in his paper that this class of diseases are not to be treated to-day and left to take care of themselves until the patients in despair return again, then receive treatment again and go along in this desultory kind of a way, but they are to be taken in hand and studied carefully, as has been suggested by Dr. Newkirk, each case to itself, and remedies that are best adapted to the individual case applied, and the patient kept constantly in view for weeks, months, and for years together. I have a good many patients who come to me on account of these diseases every year and have done so for a number of years. Their teeth are doing them good service. Occasionally there is a little pocket getting sore, and must be attended to, and cases are followed up in this manner from month to month and from year to year. I have one case in mind just now in which the teeth were so loose that they were not kept in line. They were treated about 15 years ago for the first time. When they became firm in their sockets they were considerably out of line. In the last two years I have seen that patient twice. The teeth are doing good service and are better from year to year. The first three or four years I had to see them frequently, hardly two months would elapse that I did not have to see them, but now they are doing well, the patient is chewing food well, and they are doing excellent service. It is in this way we must follow these cases, no matter what the treatment is.

In the development of new remedies we are getting those that act better in these cases, and the development of experience is very important. I have frequently before this society alluded to the importance of diagnosis in these cases. I have subdivided the cases into groups, but have never felt that I have subdivided them sufficiently, as they present so many characteristics. That

variety produced by salivary calculus is the easiest of all to manage. If you cannot manage your patient you need not do anything for these diseases. The patient must come to you to be treated. Then we have the variety produced by serumal calculus, as mentioned by Dr. Harlan, not so easy to manage, but easier than some others. Then we have a variety which is similar in which the calculus is not present at any time, and these are difficult cases as a rule. What I call phagidenic pericementitis, pure and simple, belongs to these recurrent cases. There is another variety that I have not particularly described. There is a very excellent article as to diagnosis of this in *L'art Dentaire* of January. I forget the name of the author. Perhaps Dr. Ottofy or Harlan can supply the name. The article should be translated into English. It is the best description of this variety that I know of, a condition in which the teeth become loose without apparent cause. There is no deposit of calculus, no suppuration, no considerable inflammation or soreness, and for a number of years after the loosening there is no considerable shrinkage of the gums from the teeth, but finally shrinkage does occur. I have found these cases exceedingly difficult to handle. I have a case of it in my own mouth. I do not know that I can give you much information as to the treatment of such cases. The teeth keep clean themselves. I have not been able to do much with medicines, but I have found that these cases will go on apparently indefinitely if the teeth are supported. I wear a splint on mine, and I can chew beefsteak as well as I ever did. They have not been sore, but have been too loose to use in chewing food. A little over two years ago an accident occurred while I was away from home, and the first molar below could not be used. I could not quite get at it to get it fixed for a number of months. After I had a filling made I discovered those loose teeth. When I tried to chew I could not. I had to make a splint before I used the teeth. I have used a splint ever since. As to the matter of banding or wiring these loose teeth, I regard it as very important; not that it cures the case by any means, but it will aid in the cure and give the patient comfort.

I would give a word of warning in regard to extractiug these loose teeth. Dr. Newkirk has spoken of it, and while I agree with him, yet I warn you by the citation of one case. This case is one of a number that have occurred to me. A lady came to me with several teeth considerably loosened, with serumal calculus on the

roots. I cleared off the teeth, said to the patient that I would probably extract the wisdom tooth, but not at present. We will see how the tooth does. Within six weeks that tooth was doing good duty in mastication, and it has been doing good duty ever since. I put off as a rule the extraction of these loose teeth for some time until I see what the prospect is for recovery.

Dr. Stevens: I would like to ask Dr. Black whether such a condition is not hereditary?

Dr. Black: I do not think it is hereditary.

Dr. Stevens: As Dr. Black has spoken of the loosening of teeth, I desire to mention in this connection a family of six, one of them being a patient of mine for twenty odd years. The teeth of this family were all loosened, and they kept them clean on the same principle as Dr. Black has described. Only one of the family has been a patient of mine. I have been able so far to save most of the teeth of that patient, but some of them have gone in spite of all I could do to save them. I traced back the family history, and found that the father's teeth came out in the same way, although there was no decay of them. His grandfather lost some in the same way. The patient's family, except the one mentioned, have lost all their teeth in the same manner, at about the age of forty-five to fifty. I believe it to be hereditary.

Dr. McIntosh: I would like to ask Dr. Black what he considers a hopeless case in pyorrhœa alveolaris?

Dr. Black: A case in which the teeth have fallen out. (Laughter.)

Dr. Sitherwood: Dr. Harlan's paper was interesting and instructive to me. The new remedies mentioned I shall try, and if found of real value they will be adopted in my everyday practice.

To the so-called disease (pyorrhœa alveolaris) I have paid considerable attention. In its treatment one very old remedy in my hand has been more efficient than any other single medicine. I refer to cupri sulphas, the blue vitriol of commerce. It possesses germicidal and astringent properties that are invaluable in many cases. After all deposits of tartar are removed from the teeth, and the "pockets" and loose tissues thoroughly cleansed with warm water, followed with peroxide of hydrogen, the sulphate of copper is to be applied as a fine powder. Two or three applications are generally sufficient for even the worse cases.

I had one case in which there seemed to be no disease but

simply loosening of the teeth, and the sulphate of copper produced the proper astringent effect, the teeth becoming quite firm. I had another case which did not improve, and I adopted the plan recommended by the essayist of destroying the pulp because of nodules or partial closure of the pulp chamber from ossification or something of that character, and filled the small remaining canal; then after following the usual cleansing methods, applied the sulphate of copper. This was nearly two years ago. The tooth is still doing excellent service. I was surprised that the cure was so complete in this case because it seemed to be a hopeless one.

Dr. T. W. Prichett, Whitehall: I remember to have read some six years ago a statement made by a member of the Iowa State Dental Society at one of its meetings that he had never seen a case of pyorrhœa attack a tooth in which the pulp was dead, nor subsequent to the death of the pulp, and that he challenged the Society to produce an instance of the kind. Now, if any member of the Society remembers anything of that character, I would like to know if it has been disproved.

Dr. C. N. Johnson, Chicago: I am very sorry indeed I was not here in time to hear Dr. Harlan's paper and some of the remarks made in the discussion. The remarks made by Dr. Black were excellent. We find many cases where patients come to us affected with pyorrhœa, and some dentists will tell them that their disease is beyond treatment and let them go. I think that is a bad thing to teach a patient. It is true that many of these cases cannot be cured, but the dentist has no right to say to a patient that some of them cannot be cured, because many of them can be cured, and it is the duty of the dentist in every case to take the patient in hand and do the best he can. As has been said by Dr. Black, sometimes cases which seem the most unfavorable to begin with turn out to be very satisfactory in results. I think the plan of telling patients that this disease cannot be cured is wrong. I should commend it to the members of this Society to take hold of such cases and do the best they can for them, for even if you cannot cure such cases you can improve the condition of the mouth and leave patients in a more comfortable condition.

Dr. Black: In regard to what Dr. Sitherwood has said about sulphate of copper, it is a remedy I value very highly and is of benefit in this class of diseases. I use it freely in conditions where there is considerable inflammation, or immediately after removing

deposits in some cases. I use it but once or twice, then follow with milder remedies. If used continuously, it will destroy tissue rapidly.

Dr. HARLAN: The *modus operandi* of using trichloracetic acid is a simple one. If you take a one-hundred and twenty minim graduate, and pour into it four minims of liquified trichloracetic acid, and then add one minim of oil of cassia or cinnamon, and then fill the graduate full of hot water to 120, you have it in the very best condition possible for immediate use. The oil of cassia takes away the disagreeable taste and makes it rather pleasant to the patient and does not impair its efficiency. It will dissolve calculous or serumal deposits when sulphuric acid will not do it. Dilute nitro-muriatic acid will do it. Acetic acid will not do it.

With reference to the condition spoken of by Dr. Black, where the teeth get loose without soreness, in a few cases of that kind I have used sulphur for a dentrifice, and that seems to benefit the cases better than anything else. I have used various injections in varying strength, but for simple, ordinary everyday common country practice you will find the flowers of sulphur very benficial. You can get the sulphur anywhere for about ten cents a pound. It is very cheap. Once in a while I use it in a powder. In regard to sulphate of copper, I am glad Dr. Sitherwood spoke of it, but I do not think it should be used very often. You should try to get it chemically pure, and I believe you can for a few additional cents per pound.

The point brought out by Dr. Johnson is one I wish to speak of. Whenever I consider a tooth hopeless, I do not say anything about it to the patient. I simply say to him or her, as the case may be, that he has one or two teeth that no kind of treatment will do any good, that he will simply have to lose them. But the point Dr. Johnson raised is this: They go to dentists who do not know very much about handling cases of this kind, and while such dentists may be skillful and beautiful operator in putting in gold filling for patients, they do not know how to handle a disease of this kind, consequently they tell patients that nothing can be done. After a while those patients go to some one else. If these cases were in the hands of a competent surgeon two or three years before this their teeth might have been saved. I have patients that come to me from New Orleans, Omaha and Kansas City, who have plenty of money and lots of time, and if they had come to me two

or three years before they did I could have saved every tooth in their mouths. So I say it is the duty of the dental profession to recommend their patients to somebody who will pay particular attention to them and not send them away and have them lose their teeth. It is here that the dental profession makes a great mistake. If a man came to you and said he had enlargement of the liver, would you let him go without recommending him to a competent physician for treatment? And so if we simply pay attention to these cases in the future more than we have in the past a great many people will save their teeth.

A word with reference to the facilities for handling cases of this kind. We must have the proper instruments for the removal of deposits around and between the roots of teeth. I do not confine myself to one or two instruments or one or two sets. I have fifty or more, and if I cannot do it with one, I can do it with another. Then we should have facilities for making solutions and pastes, so that you can make them in two minutes before your patient. I have half a dozen or more marked graduates and I can make the solutions I want. Always have hot water and the various cleansing preparations that are needed, and syringes enough, so that I can treat half a dozen cases in succession and not use the same instruments before they are cleaned. I think there are many cases of this kind transmitted from patient to patient from lack of attention to the cleanliness and sterilization of instruments. I think a great deal of care is necessary in that direction.

CONSERVATISM IN CROWN AND BRIDGE WORK.

By C. B. Rohland, A. M., D. D. S., Alton, Ill.

A large proportion of the "want" advertisements calling for assistants in our journals signify that the applicant must be "well up in crown and bridge work." Assistants also in advertising for situations announce, as the most important and taking of their qualifications, that they are "well up in crown and bridge work." Even colleges now indicate in their announcements that special attention is paid to these branches, and offer increased facilities, to the end, that their students may become especially proficient in crown and bridge work. Advertisements in innumerable dailies and weeklies, adorned with fetching cuts of plateless substitutes, also show that this is being made a specialty to a very large extent.

As an indication of an awakened interest in metal working and a gradual return to the skill and manual training of the old metal workers in dentistry, this is gratifying, and not the least of the debts that dentistry will probably owe to this revival, will be the gradual abandonment of the slipshod and slovenly methods due to the introduction of rubber and its equivalents. The workman, whose conception of mechanical dentistry is bounded by gum teeth and the vulcanizer, is no longer equal to the task of presiding over the modern laboratory. The precious metals are now to the front, and no one is considered competent to assume the responsibilities of the laboratory, unless he is "well up" in their use.

This is a delightful change from but a few years ago, when almost anything that had two hands, and could watch a vulcanizer and mix plaster, would do. As an indication of a "fad," however, that is being run into the ground, and that is ruthlessly sacrificing scientific requirements on the altar of elaborate mechanism, the situation is one that may well call for thoughtful consideration. The indiscriminate use of these valuable adjuncts to prosthetic dentistry has become so prevalent that in the judgment of your executive committee, with which many others heartily agreed, this

subject was considered of enough importance to merit a place in the discussions of this meeting.

It will not be the purpose of this paper to decry either crown or bridge work. The system, even with its many imperfections and limitations, is unquestionably the greatest advance in dental prosthetics that has ever been made for the benefit of a suffering public. This much is freely yielded to begin with. It is only intended to call attention to a stubborn fact that is too often lost sight of; that it is not a panacea, but that it has its limitations beyond which the honest dentist must not allow himself to be carried by his enthusiasm or his greed.

There is considerable temptation to the unscrupulous to shut their eyes, when conditions contraindicate this class of work, because of the money there is in it. The enthusiastic bridge worker nearly always clinches his arguments with the all-sufficient and telling assertion of how well it pays.

Because, too, of the gratitude and good opinion of the patient, in that, restoration is complete and immediate.

Because of the opportunity it offers of constructing handsome, showy and expensive pieces of jewelry, with which to astonish the patient and his friends, and gain, perhaps through the faithful work of a paid assistant, a reputation for most wonderful skill.

And, because of competition. The competitor across the way does it, and must not be permitted to monopolize all the glory to be gotten out of this "latest and greatest invention" of modern dentistry.

Besides, its advantages are real and obvious, in that it provides a system of replacing lost and restoring broken down and useless teeth and roots, dispensing with a plate that interferes with both speech and taste; that is not firm; that is liable to produce pathological conditions of the mucous membrane covered by it, and denudation of the cervical parts of the natural teeth touched by it The new denture, on the other hand, is firm, strong, fixed, and capable of doing work not possible to a movable plate. It is especially adapted to small spaces where the substitutes hitherto in vogue have so often been so unsatisfactory.

Nevertheless there are objections and limitations which, in its present stage of development, are real enough to materially curtail its applicability, objections too frequently made light of, or entirely ignored, but which should have enough weight to act as a check

on its indiscriminate use. I shall pass over the special consideration of crown work for the reason that, as it forms an integral and important part of bridge work, much that may be said of the latter necessarily applies with equal force to the former.

First and foremost, there is no other operation in dentistry calling for such a high grade of skill, such a comprehensive knowledge of anatomical and physiological relations, such fine intuitive perception of pathological possibilities and probabilities, as bridge work. Dr. W. G. A. Bonwill truly described the situation when he once said, that "but few even of the best dentists are capable of performing the high class of work necessary to make it (bridge work) successful."

The problems in almost every case are so deep, and so far reaching, that the average dentist should approach them with all humility and caution. This applies to the crown work part as well. To make a perfect fitting cap or crown in all cases is not the easy matter many apparently take it to be. The assertion has been made that not more than one in five crowns made by skilled hands turns out to be such a perfect fit as to absolutely keep out secretions. My experience and observation lead me to accept that statement as containing a large amount of truth. If that applies to skilled workers what shall be said of the productions of the average dentist? The testimony of all expert bridge workers is, that the highest grade of skill alone is equal to its demands. This, then is the first limitation.

Again, to keep the denture even approximately clean is a matter of some difficulty. Much depends on its proper construction, much also depends on the patient's efforts. The two combined will go a great way toward securing fairly good hygienic conditions. The best gold and porcelain work is, however, liable to disagreeable odors. No amount of skill and care is able to unite gold and porcelain so perfectly as to keep the secretions of the mouth from between them. In addition, very many patients are *not* cleanly, and will *not* expend the time and effort necessary to secure good hygienic conditions. That lack of cleanliness in any artificial denture is frequently responsible for disturbances, both local and systemic, goes without saying. These conditions are liable to be very much worse in a fixed denture, and may become so bad as seriously to impair the health. Now it will not do for the dentist to throw the entire responsibility for such a state of af-

fairs on the patient. His habits, disposition, as well as physical condition must be considered. If the dentist knows them to fall below the requirements, and has every reason to expect that ere long the denture will become the abiding place of fermentation and putrefaction, he has no right to jeopardize his patient's well-fare by inserting extensive bridge work. Here then is another limitation. Bridge work is not for the careless and filthy of habit.

Further, while bridge work as usually constructed is stronger than any other denture made, yet owing to its immovability, it is subjected to much harder service, and relatively is just as much, if not more liable to break. The porcelain facings are prone to check and fracture. When that does happen it is a serious matter. To remove the piece for repairs, can only be accomplished with difficulty, and frequently involves its partial or entire destruction. That this is a serious matter, and of not unusual occurrence, is evidenced by the frequent suggestions offered by experts how to make repairs in the mouth, none of which so far seem satisfactorily to solve the problem. Now, if this liability to fracture is reduced to the minimum by protecting tips and cusps of gold, as the custom is, the effect, when the denture and its golden piers are in sight, is simply shocking. To mar the human countenance with such gilded monstrosities may sometimes be justifiable, perhaps even unavoidable; but the patient's sex, occupation and facial characteristics may, on the other hand, be such as to absolutely forbid it. Here then is another limitation. Such conspicuous "high art" combinations of gold and porcelain are not for those in public occupations where success depends so much on agreeable personal appearance.

Again, the fact that in a true bridge replacing the six front teeth, the contour of the gum cannot be restored, and that by reason of the "self-cleansing" space considered necessary between the teeth and gums, articulation is necessarily imperfect, bars the use of this kind of bridge work for the orator and the vocalist. By a "true bridge," I mean where the porcelain substitutes are suspended between the piers and do not depend upon the alveolar ridge for support.

Another serious consideration is the strain put upon the supports whereby two or more roots are made to support, not only their own crowns but their neighbors as well. Where molars and bicuspids alone are involved, this objection may, in some cases, be

more apparent than real, providing the denture has been constructed with a due regard to proper occlusion and a proper distribution and direction of the force of mastication. Indeed it is possible sometimes, by skillfully taking advantage of the anatomical conditions, to so balance the force of occlusion and so steady the supports themselves, that they are better able to stand the increased burden than they were originally. Where, however, cuspids and incisors are linked together, where the former, for example, support the latter, where the impact is outward or inward instead of in a straight line with the long axis of the tooth, the objection becomes very real, and only the strongest and healthiest supports will do. Now this limitation, one would naturally suppose would be accepted as an axiom for all cases, but when one sees statements made by enthusiastic advocates, men of standing too, that loose, diseased teeth can be used for supports, and that the quicker these teeth are bridged and crowned, even though abscesses be still discharging, the better they will heal, it seems to me the climax of disastrous advice is reached. The absurdity of this does not lie in the claim that loose, abscessed teeth will respond more readily to treatment when held firmly in position, but, in the assumption, that a superstructure built on such foundations, is likely to be a success in utility and durability. That an occasional case of this kind has stood the test of a year or two is not sufficient to wipe out this limitation. One swallow does not make a summer. Bridge work is not for mouths lacking in good sound, strong and healthy supports and plenty of them, and the dentist who fails to give this requirement its due consideration, is surely breeding trouble for the future. He will find that in more senses than one, "bridge work has indeed come to stay"—unfortunately, however, not with the patient.

Again, spaces, otherwise well adapted to be bridged, will often present themselves when only sound teeth with healthy pulps can be utilized for supports. As a rule, the mutilation or excision of sound teeth or the devitalization of healthy pulps simply to furnish supports for one or even more substitutes, is a piece of unjustifiable vandalism. I admit that this rule too may have its exceptions. I can even conceive of cases where the conditions might justify it. Given, an otherwise perfect denture with but one upper bicuspid gone, the space bounded on either side by perfect teeth, and I cannot conceive of any combination of conditions justifiying their

mutilation for the insertion of a bridge. Given the loss of an incisor in such a denture, and I can conceive of conditions, such as sex, social exactions, or occupation, which might justify some sacrifice. War cultivates in its votaries a lessened regard for the value of human life. Bridge work may be said to have a tendency to cultivate in its votaries a lessened regard and veneration for sound teeth and living pulps, a tendency much to be deprecated. The problems presented are often very perplexing and difficult of solution, and the conscientious dentist must see to it that the deficiencies to be corrected are not overbalanced by the sacrifices required.

Further: Pathological tendencies are necessarily always present to a greater or less extent in pulpless and capped teeth and ferruled roots, no matter how thoroughly the diseased conditions may have been treated, or how skillfully the caps and ferrules may have been adjusted. This is especially true of teeth once diseased, and their condition is very much affected by variations in systemic conditions resulting in impaired health and lowered vitality. The tendency to a recurrence of disease in teeth once subject to inflammatory conditions being recognized, and that caps, crowns and bridges are foreign bodies exerting more or less deleterious influences, and that a high standard of vitality exerts a powerful influence in holding these tendencies in check, it follows, that the general health and vital tone of the patient becomes an important factor in deciding either for or against the advisability of this work.

Again: In view of the problematical durability of bridge work, the expense thereof rises to the dignity of a real objection. I have said "problematical durability," for while the system is based on correct scientific principles, its development dates back but a few years, and the question of durability still remains to be proven. In doubtful cases, the dentist has no right to trifle with either the confidence or the pocket of his patient. Only when the latter is fully informed, and is both able and willing to make the experiment, is he morally absolved.

To sum up: While bridge work in selected cases is unquestionably a most valuable adjunct, in its present stage of development its general adoption and universal application is limited.

First--By the high grade of mental, moral and manual equipment required on the part of the dentist.

Second—By the favorable physical conditions necessary in the mouth. This refers to the abutments, the width of space to be spanned, the health of the tissues, occlusion, etc.

And Third—by the health, habits, social and financial condition of the patient.

It is not the intention of this paper to discourage any one from studying and adopting the system. It is too valuable to be yielded to the very few of exceptional attainments. The object, as said before, is simply to call attention to its limitations, its difficulties, that thereby it may be approached with the care, caution and intelligent appreciation of its requirements, that it should have. The system is still in its first phase of evolution. It is growing and gradually widening its sphere of usefulness. Methods and appliances will unquestionably be devised to simplify and overcome acknowledged difficulties. Until then let not hot enthusiasm obscure cold judgment. Let discrimination attend its use.

DISCUSSION.

Dr. W. H. TAGGART, Chicago: The paper of Dr. Rohland fills my idea entirely. It is conservative, and I try to be so in my practice. The objections that he has raised against some of the bridge work he has met, will hold good with amalgam and gold fillings, the bad results that come from this way of doing things, bad practice, etc., is just as harmful in gold fillings if we follow the same methods in bridge work. There are so few dentists who are willing to take the time necessary to do the work properly. One of the points made by Dr. Rohland is not supported by facts in the case, and that is, there is no class of dentistry that is so poorly paid for as bridge work properly performed. I do not think it is possible for the dentist, if he is in the habit of getting what we call a country price of $1 for an amalgam filling, to do bridge work at $25 a tooth and made as much money as on an amalgam filling. In order to make money on bridges less time must be put in, so that as much money can be made out of it as in other lines of practice; consequently we have a poor grade of work and bridges are condemned on the wrong ground.

In regard to sacrificing the pulps of teeth in putting on a bridge, if the mouth needs a bridge it needs it more than a tooth needs a pulp, consequently I would destroy that pulp in order to make a perfect bridge. I do not think it is possible to make a perfect bridge and put it over a live tooth. This statement may

seem radical. You can do little harm by destroying the pulp, but you can see a difference in the kind of bridge you make for the mouth. When the root is properly trimmed and a band put on it, there is no inflammation about the gum. The gum will heal more kindly, and the band comes down smoothly against good healthy tooth substance. I have had cases where the gum had receded from the neck of the tooth, and there was a condition of the neck of the tooth that made it impossible to treat the gum so it would grow up snugly and healthy around it. When a band was fitted properly the gum would heal kindly about it. It has a good healthy look and recession ceases; in other words, the gum will "hug up" against something that has a smooth surface.

Dr. W. O. Kulp, Davenport: My specialty is not bridge work, but I have had some experience with it, both as an operator and as a patient, as I have perhaps the oldest bridge in my mouth made for a dentist. The points in the paper were well taken. It requires conservative judgment to make bridge work a success. Most of us who make bridge work, especially those who are wearing it, are very apt to reach out very far, sometimes too far, because we realize the fact that there is really more comfort in bridge work to the wearer than any other class of artificial work.

We therefore run risks by putting them on loose teeth that may not last long. I am speaking now from the standpoint of a wearer as well as an operator. When a medical student thirty-six years ago, I had the misfortune of loosing a left superior cuspid and second bicuspid (having earlier lost the first molar). From that time to the present, I had worn more than twenty-five different appliances made by many different men, as well as many of my own construction, hoping to find something that would be a substitute for the natural teeth. But it was in vain. I had almost sacrifice the last remaining bicuspid and molar, by clasping upon them the various appliances, when my attention was directed to bridge work, which was made as I shall hereafter explain. Suffice it to say—it has been a perfect substitute for the lost teeth. Permit me to explain how my attention was first called (practically) to bridge work some fourteen years ago.

I had a patient for whom I had made various plates, she having lost four incisors, two bicuspids on one side and one on the other. She was one of those peculiarly sensitive patients that could not bear anything in the mouth. I finally told her that I

saw an advertisement in a Chicago paper, put in by some one who claimed to make artificial teeth without plates.

As she had plenty of money and time, I said, "Supposing you go there and try it!" She went to Chicago by the next train and had the false teeth—without a plate—came back and showed them to me. I watched them closely for some few months, and she seemed perfectly delighted with them. I had not seen her for a considerable time, when one day she came into my office (while Prof. Hunt was visiting me) when we examined her case quite critically, and discussed the subject quite freely. Finally we concluded to invite Dr. Low, who operated for this patient, to come down and show us about bridge work. I was the victim. The first meal I eat with that bridge in place, I said, *Eureka!* I now had a substitute for natural teeth. I could bite on it.

Speaking of the risks we run, I wish to give a little experience which quite surprised me. A gentleman came to my office, who had heard that orators could not wear bridges. He had an upper partial plate upon which were attached the six anterior teeth; a second bicuspid on one side, on the other, two bicuspids and one molar. In the lower jaw he had left two third molars which were loose, and one cuspid on the left side, which was partially firm, also wore a rubber plate. The patient said he was in the east and saw a friend who had a bridge in his mouth which he praised so highly, that he said he had come to me to see what I could do for him in the way of bridge-work. I looked his case all over, and said: According to my best judgment his case was not a good one for bridge work. Then he asked me whether I could make a bridge for him. I replied that I could, when he asked me how much it would cost. I told him what both the upper and lower would cost, but that I could make an upper bridge with more prospect of satisfaction to him than a lower one. He finally decided to have an upper bridge made. I capped the teeth that were remaining. Using English hunchback plain teeth, set them up against the gums, did not cover the cutting edge of the incisors.

The teeth were somewhat short, but the patient was delighted with the bridge, and said that he wanted me to put in the lower one also. I told him that if I put in the lower bridge, I simply would be robbing him of a large amount of money; as it would cost him not less than $175 to do it. The teeth that I must use as anchors were too loose. He asked whether it would last a year and

a half. I told him it might last a year or two, possibly three years. Whereupon he decided to have the bridge put in. I first capped the molars with thin platinum (it being impossible to get the gold bands over the teeth to reach under the free margins of the gum and fit the teeth); I put cement in the platinum caps and drove them down, then burnished them clear under the free margins of the gums. Over that I put caps for the bridge, allowing them to extend down over the middle division of the teeth. I had no difficulty with the cuspid, as it was straight. I covered it with gold, allowing the gold to run under the free margin of the gum. I happened to have some old stock of plate gum teeth, which I had left from my early days in dentistry. They were great big ones, such as we used to fill up the lower jaw so as to give the face the proper shape. I cut them down to fit the arch, and covered the grinding surfaces with gold, fearing they might break. I filled up his jaw. I applied the bridge, and to my surprise, it was as firm as a rock. He wore this bridge for seven years, being perfectly satisfied with it. One day he came to my office and said that he had written an article "about bridges." Thought he would like me to see it before he put it in the paper. He said it was his duty as a minister, for the good of the public that they generally should know something about bridge work. Of course the article was not published. He went to Europe, and while in London, a friend of his told him that they had a great deal better candy in Europe than in America. He said he was fond of candy and would like to have some of it. He partook of some of the English butterscotch candy, and in his eagerness to eat it he pulled out the third molars. He wore the bridge hanging to the cuspid, until his return home.

I now desire to call your attention to an investment material which I have used for some months with a good deal of satisfaction. It is known as steamfitter's or plumber's asbestos cement mixed with plaster of Paris. It gets perfectly hard and firm. I have yet to see a crack in the teeth where it has been used.

THINGS OLD, NEW AND USEFUL IN THE OPERATING ROOM.

By Dr. A. C. Hewitt, Chicago, Ill.

"Things old, new and useful in the operating room," broad enough to inspire a book, has not led me to that attempt. In the little I have to say I have avoided the topics named in the programme assigned to others.

Begging, therefore, the indulgence of the sages of the societies, I will address myself chiefly to the younger members of the convention, saying something about detergents, antiseptics and obtundents. Not at all in a scientific way, but formulating some substances, "things" that I have found useful in everyday office practice.

Clean, soft hands, whether old or new, are still useful. The successful busy dentist must sometimes handle flask, file and forge; he must occasionally hold the crucible, the die and the scraper; he must sometimes grind at the lathe, and polish at the buffer. His hands get soiled. Soaps? Yes, if scentless, or at most, of the daintiest odor. These will not always whiten. The following is excellent:

℞

Pulv. Acidum Boracicum,	ʒxij.
Pulv. Sodæ Carb,	ʒxxiv.
Pulv. Pumice,	ʒxxij.

Glycerine q. s. to form paste.

Sig. Use as a soap.

If hands are stained as with nitrate of silver, wet the stains and rub with cyanide of potassium, then wash. Never apply soap first as that sets the stain. This paste is searching in action. An emollient should follow, and as perfumes are not always agreeable to the patient, especially in the mouth, nothing is better to soften, smooth and render the hands agreeable than the following lotion:

℞

Liq. Potassæ Arsenitis,		ʒiv.
Glycerine,		ʒiii.
Spir. Myrcæ,		ʒxvi.
Aq. Pura,	ad	ʒxxxii.

Sig. Lotion for hands, face, etc.

After washing with the paste and drying with a towel, moisten the hands with the lotion and let it evaporate. In making this lotion use only the best of bay rum; that distilled from the bay leaf, not bay oil and alcohol. Keep it from your wife and daughter or be prepared to furnish it to them. Once having learned the value to face, hands, arms and neck, they will give you no peace till they have a supply.

ANTISEPTIC SPRAY.

Operators run great risks from working over patients suffering from la grippe, catarrh (nasal), incipient diptheria, scarlatina, not to mention syphilitic taints and tuberculosis. If a hint of any of these is present, before operating some precaution should be taken. A spray prepared to be used from the atomizers of the drug store is of special value, prepared as follows:

℞

Antiseptic Pastilles (Carl Seiler's formula, Pastilles),	i.ss
Aq. Pura,	℥i
Hydrochlorate of Cocaine (4% Sol.,)	℥ss
Glycerine ad q. s.,	℥ii

Sig. Use as spray.

Crush and dissolve the pastille first in water, boiling water is quicker, then add cocaine. It will turn milky and cloudy. Add glycerine, which will immediately make the liquid clear. Spray nose, mouth and throat, and you will be safe. This spray is admirable to benumb sensitive gums, before using the gilling-twine to hold rubber dam in place. It is exceedingly useful also in allaying irritability of soft palate in taking impressions.

A convenient way to make and keep a 4 per cent solution of cocaine, is—

℞

Hydrochlorate of Cocaine,		grs.xxxviii
Glycerine,		℥ii
Aq. Pura,	ad	℥ii

M.

Thus prepared and covered from the light the solution will keep an indefinite time.

An admirable, safe, efficient cleanser of instruments antiseptically is hydronaphthol. I am indebted to Prof. Harlan for the suggestion that has led to the use of this valuable drug.

℞

Hydronaphthol,	ad	grs.xx
Alcohol,	ad	℥ij

M

Put into a wide-mouthed bottle—as a quinine bottle. Dip your instrument, whether excavator, forceps, searcher, or pyorrhœa blade, into the liquid, and lay away to dry. The most delicate steel will not be tarnished by it and it needs no wiping.

Hydronaphthol as a dressing to septic root canals has few equals in value. I think there is nothing superior or more convenient:

℞

Ol. Caryophilli,
Ol. Cassia aa, Fl.ʒi
Hydronaphthol, gr.xx

M. Sig. Antiseptic for root canals.

Again, thanks to Prof. Harlan for the suggestion leading to the formula.

Eucalyptol (Sander & Sons' Eucalyptol E Foliis, do not mistake oil of eucalyptus wood for the foregoing).

If you wound your hands and fear blood poisoning, at once apply the eucalyptol, and cover with chloro-percha, and you will be safe. If for any reason you wish to extract a tooth and replant (to trim a node causing neuralgia, or to remove from a foramen a broken broach), after extraction holding the tooth in the forceps dip it in eucalyptol, trim and smooth the root, enlarge the root canal through the foramen, fill the canal, redip the tooth in eucalyptol, put it back into its socket, driving it well home, and you will tire of waiting for suppuration or root absorption. On no account touch the tooth with water, and if possible keep the socket free from saliva. Replant through the coagulated blood that is in the socket. In my surgical practice I have learned not to apply water to any wound except where demanded for removing dirt. Blood and serum, kept aseptic, are nature's provision for healing by first intention.

OBTUNDENTS.

There is so strong a desire on the part of the patients for "painless dentistry" and such a stress on the part of the operator to avoid giving pain, that I think I may be pardoned if I occupy some of your time upon this subject. Quacks (and unfortunately we have them in our profession) advertise obtunders both for sale and for use. I have taken some pains to investigate some of these compounds, they being furnished by sample. That some of them possess the property of local anæsthetics cannot be denied. And I

have found that just in proportion to the effectiveness of the drugs the mixtures contain more or less cocaine in one form or another, even though advertised not to be made from any of the derivatives of the coca plant. So strikingly has this been the result of my experiments that I have been led to compound an obtundent. The result has been most gratifying. My chief reliance has been upon the hydrochlorate of cocaine. Before giving you the formula that I employ I will detail a case or two by permission of my patients. Miss May Cleo Smith, D. D. S., of Kenosha, Wis., had a left superior bicuspid root that she wished removed. Gas? No. ether or chloroform? Emphatically no. I suggested my obtundent. "Yes, she would like that if I thought best." Her willingness and the growing pallor of the mouth and lips induced me to try it. I applied it in a way I shall describe, and removed the root, by no means an easy operation. Process and tissues were as firm as her will. I will describe the operation that you may the better judge: Using a sharp-bladed forceps I thrust the outer blade along the root under the gum over the unabsorbed process, cutting my way to the point I judged sufficient. I passed the inner beak over gum and border that I might get a sufficient hold for traction. After the root was removed she expressed the utmost gratification. She said "it did not hurt, though I expected it would." I want your formula if you will favor me." Not a nervous person (hysterically), but of a fine organization capable of suffering, clear headed, conservative in her character, her words are weighty.

Mrs. ———, wife of Rev. Dr. ——— of the —— Presbyterian Church of Chicago, had several teeth extracted, preparatory to a full upper denture. Averse to anæsthetics, she yet readily assented to the obtundent. I think seven teeth were to be removed. "Between times" she unaided leaned over the cuspidor and freed her mouth of blood. After the teeth were out she expressed the utmost satisfaction. To repeat the substance of her words: "That is better than gas." I could feel the forceps grasp the teeth, but it did not hurt. I kept expecting it would hurt, but it was painless." In this case I gave from the mouth of this bottle [exhibiting it] about four inhalations of chloroform. She was not aware that she was taking the anæsthetic. By the same method, as in the last case, I extracted for another lady three solid roots, one a superior incisor and a cuspid tooth. The latter broke at the border, and I had to

"reach" for the root. After the operation the patient, a large strong framed woman, said: "Oh that is delightful! I am going to tell Mr. ——— who has teeth to extract, no need of gas." I might add case after case to the same purport, but the above are sufficient.

The relief from shock, the help to operator and patient, has led me to its permanent adoption. I give you the formula and my mode of application. Perhaps the eminents in our profession may suggest an improved formula. I certainly should receive suggestions with much gratitude. I have been not a little perplexed to find a name that is at once suggestive, explanatory and honest. For want of a better and for the present I will name it

COMPOUND COCAINE PIGMENT.

℞

Cocaine Hydrochlorate,	gr. cxx
Atropinæ,	gr. $\frac{1}{10}$
Strophanthin,	gr. $\frac{1}{5}$
*Hydronaphthol,	gr. x
Ol. Caryophilli,	♏ii
Ol. Cajuputi,	♏ii
Glycerine, ad.	℥i

M. Sig. Use with applicator as local anæsthetic.

The cocaine should be in characteristic prisms (of the smaller rhombic system) and clean crystals, as that sold in fine powder is often adulterated with morphine and other substances to give it weight. Pulverize the cocaine before mixing to hasten solution.

In Prof. Ingals' work, "Diseases of the Chest, Throat and Nasal Passages," is to be found a formula for local anæsthesia, which is as follows and which I give by his permission:

℞

Atropinæ,	gr. $\frac{1}{10}$
Strophanthin,	gr. $\frac{1}{5}$
Cocaine Hyd. Chlor,	gr. xx
Acid Carbolic,	gr. x
Ol Caryophilli,	*m.* iii
Aq. Dest, ad.	Fl. ℥i

M. Sig. Local anæsthetic.

Dr. Ingals informed me that the formula had been used under copyright, advertised for "painless dentistry," etc. The right to

* In reply to a question Prof. Harlan suggested Betanapthol as a better drug for the purpose. Upon investigation I agree with him, and with thanks to him, advise the change.—A. C. H.

use, sold at large figures, etc., etc. He also said that he deemed it safe as a "hypodermic" to the extent of five minims, and that its local anæsthetic effect was marked and reliable.

A good way to apply the "Pigment" is: 1st, bathe the gums surrounding the teeth to be extracted, with alcohol and hydronaphthol to remove mucus and all foreign substances from the gums and membrane surrounding tooth neck and roots. This is important. 2d. With warmed wax or modeling compound take an impression of the teeth or roots. Remove from the mouth and slightly enlarge and deepen the impressions of the several teeth or roots to be drawn. Place a small pledget of absorbent cotton dipped in the pigment in the enlarged tooth and root impressions, and carry to the mouth, which, after the alcohol bath, should be made as dry as possible. Press firmly home and hold there from four to ten minutes. Three things are essential to success; clean gums and necks of teeth, absence of saliva, and close contact by the mixture. Do some of you say, "That is too much fuss, too much nicety of preparation?" To such I reply, do not use it, you will fail. No one will succeed in any operation in the largest sense without minute care at every step. The minuteness, the care, or their lack, mark the difference between the skilled operator and the bungler.

This brings me naturally to the consideration of a "thing" and "object of thought" more sinned against, more abused, a substance in the hands of the unskilled and the reckless, as dangerous to human life as prussic acid, or dynamite, but used properly, legitimately, as safe as the odor from the heart of a rose. Neither "new" nor "old" strictly, in a general way known to everybody, but scientifully as little mastered both in substance and action as the nebulæ of the milky way—chloroform, the king of obtundents. I use the word obtundent rather than anæsthetic in speaking of chloroform in this connection, because it seems to limit its use to a degree less than is commonly attached to chloroform. Please remember that I am not using terms with exact meanings.

I shall not abuse the privilege of this convention by attempting a learned discussion of its discovery, manufacture, purification, chemical components, nor of its mode of action as an anæsthetic, its toxic action, nor of the modes of restoration to be used when an overdose is given. With all these you are doubtless as familiar as I am.

The more clearly to define my attitude in relation to chloroform as an obtundent I wish to say that in all the range of operative dentistry, and in the demands of oral surgery there are but four to six operations demanding or justifying its exhibition, to complete anæsthesia. The obtundent influence is ample. So well convinced am I of this, that I do not hestitate to say that in case of death in the hands of any dentist (not skilled as an oral surgeon and supported by skillful medical counsel) indictment, conviction and imprisonment would surely follow if a thorough, intelligent prosecution were pressed. Under no circumstances is a dentist justified in fully anæsthetising a patient for extraction of teeth or for the minor operations of oral surgery. An incident occurred to the writer of this paper while he was a medical student aged about twenty-two years, which made a profound impression. A right inferior molar became painful beyond endurance. Under the obtundent influence of chloroform he lanced the gums, as was then taught, and extracted his own tooth without pain. Since that time he has availed himself of its beneficence with growing wonder at each recurring miracle. His faith has grown until it has become a verity. During a somewhat lengthened practice never an accident, or an approach to one, has occurred, so far as he knows, though used many thousand times. As a result of careful study and extensive use, he does not hesitate to commend its general use always as an *obtundent.* (Please observe the emphasis of that word.) When given, as I shall describe, it is safe for the young and aged, the robust and feeble, the sick and the healthy, the nervous and the stolid. Even the insane yield to its charm with a delight that is pathetic to witness. Thus used as a temporary alleviator of pain, however intense, chloroform has no known rival.

HOW ADMINISTERED.

Having tested almost numberless devices, from a sponge to an elaborate machine, I have chosen a means so simple as to be almost ludicrous. A wide-mouthed half ounce to ounce bottle. An ordinary morphine bottle is as good as any. Any glass bottle two and one-half inches high, an inch and one-half diameter, with mouth three-fourths of an inch across will do. Of course it should be *clean.* If the chloroform is to be kept in the bottle after administration the cork or stopper should be hermetical, and the bottle wrapped in dark paper, and kept in a dark place. The

chloroform should be pure, never of a doubtful manufacture. No preparation of the patient is necessary, except that an empty stomach is to be preferred. Or if the drug is to be given soon after a meal, the food should be light in quality and quantity; otherwise if the *obtundent* effect is pushed to, or near the anæsthetic line, slight nausea may supervene—the only ill effect I have observed even with the stomach overloaded.

Place not to exceed a teaspoonful of chloroform in the bottle. With it open, place it near one nostril of the patient, nearly on a level with the nose, remembering that the vapor of chloroform is heavier than the atmosphere, and the narcotized air tends to fall. Compress the opposite nostril, and direct the patient to take long steady inhalations across the bottle's mouth. Do not tolerate spasmodic or jerky breathing. When an inhalation has occurred, remove the bottle so that nothing exhaled shall enter to contaminate the chloroform. At first the bottle should be distant enough for only the faintest odor to be detected. At no time near enough to irritate the fibrillæ of nerves spread out upon the Schneiderian membrane, the throat and lungs. Do not *give peripheral nerves a shock*. The medulla oblongata lies closely contiguous, and will respond to the irritation all too readily. Remember that the nerves of the mouth, nose, throat and lungs in their ultimate distribution, if on a plane, cover a space of twelve to fourteen hundred feet all readily accessible to the narcotic laden air. Nerve impulse largely controls the sanguinous circulation. The blood readily absorbs the drug, and its globules roll over each other to the heart, to be sent out to brain, viscera and ganglia.

Again I say avoid shock—the first, more common cause of death from chloroform steal over the peripheral sentinals, so gradually, so warily that they shall not fire an alarm to trigemina and medulla. As the long, regular breathing goes on, the bottle can be neared, till stronger vapor is taken. Presently the eyelids will begin to droop or "wink lazily;" the muscles somewhat relax, and an *obtundure*, if I may coin the word, creeps over the nerves. In such a state I extracted my tooth, and in such a state I have for others taken many, many teeth (too many I now fear). In such a condition patients will submit to merciless cutting or drilling sensitive dentine. In this condition can the drill or bur be carried to the live pulp, and the pulp be amputated, and afterward the patient will say, "I knew what you were doing, but it did not hurt."

In the case of children they will sometimes moan and cry out, but after the restoration express no resentment, and all dread of subsequent operation is dispelled.

You will ask, in what way does your mode differ from the ordinary? I answer, in the avoidance of shock, by giving large volumes of air carrying and attenuating the narcotic and stopping short of full anæsthesia. To show how different the line of procedure, I wish to quote from Vol. III., American System of Dentistry," page 109, under the head of "Preparation of the Patient" (for inhaling chloroform), the writer says: "Owing to the irritant effect upon delicate cutaneous surfaces of chloroform when contact is close and constant, the face of the patient especially about the mouth and nose, should be anointed with some fatty substance as a protective shield."

I do not hesitate to say that an operator or surgeon, whoever under any circumstances should apply chloroform so closely and continuously to mouth and nose as to require an unctious shield, is no more fit to give it or to teach others to administer it than is a child to play with matches in a powder house.

Since writing the above the April number of *The Dental and Surgical Microcosm* has come into my hands, wherein I find my views ably supported. Dr. J. R. Simms speaking of anæsthetics says: "A true anæsthetic should not produce any irritation of the epiglottis, bronchial tubes, or pulmonary membranes. Dr. Hayes, of Pennsylvania advertises in the same number an apparatus whereby he measures the per cent of narcotic in air, and begins with one per cent of chloroform and increases gradually and "scientifically" (?) till narcotism is produced. It may be classed as "New" and I am inclined to think it "Useful" and if there were no other and simpler way of safety it would be cheap at $70 for the lease of it during the life of the patent.

Is the way I have described safe and efficient as an obtundent, and practical for daily operative use? I answer with all the emphasis at my command, yes, yes.

The Rev. Dr. Lawrence, the eminent divine and pulpit orator of Chicago, says of it after an operation upon exceedingly sensitive teeth, I give his words over his signature by permission:

"I have carefully watched the effects upon myself of the use of chloroform while undergoing dental operations. Of course I know that the application was not such as to be a full one. I have

been conscious most if not absolutely all of the time, and yet I have had no pain, and what was better no fear of pain and consequently none of that frightful nervous strain which is really more trying in the present and the future relation of the patient.

"In all cases I have not detected the slightest ill effect upon any function after leaving the dentist's chair, on the contrary I experienced a physical sense of comfort and relief.

"I was in my childhood prejudiced against all anæsthetics and especially chloroform. I tried the experiment because of my nervous sensibility and with reluctance and close inspection of every symptom. My experience has in my case fully justified and commended the application."

(Signed) "Wm. Lawrence."

Dr. Homer M. Thomas of Chicago, a gifted writer, lecturer and practitioner of medicine and surgery, permits me to quote him as giving hearty approval of such a use of chloroform.

Dr. E. Fletcher Ingals, of Chicago, professor of diseases of the throat and chest in Rush Medical College and in the Northwestern University, Woman's Medical School permits the use of his name in endorsement of such a use of chloroform. He says:

"Having witnessed two deaths from chloroform, I was naturally averse to its use in dental operations upon my family. However, yielding to the request of my wife that she might take it, and trusting to the care and experience of our dentist, I consented to the careful use of chloroform in this way, not only with her but with my children and I am greatly pleased at the result. The operations which formerly caused the most intense suffering and dread are in this way easily borne and satisfactorily finished.

"I am greatly interested in this method of using this anæsthetic and have for years advised a similar plan which I first saw recommended by Balfour for the relief of the agony of angina pectoris. Thus used it appears perfectly safe, but I confess myself surprised to find it so effective in preventing pain."

During more than twelve years past at my office on Adams Street I have thus administered chloroform as an obtundent to all sorts of patients, if I may thus describe them, with no other ill effect than the slight nausea that I have described. I cannot truthfully claim immunity from ill results of operations where no obtundents have been permitted. Shock and nervous illness have followed many times consequent upon operations when from preju-

dice I was not permitted its use, and that too, though I have long since learned the attendant danger and have gradually lessened the length of the sittings.

Two classes of dental patients call especially for avoidance of pain. Children from four years (even younger) to twelve or fourteen, and nervous persons, male and female, over that age. There are some persons of so stolid a make that they seem not to care for or fear any operation. They apparently have tendons for nerves, lymph for nerve fluid, adipose for peripheral, and cuticular ganglia. Some such have astonished me and challenged my credulity by saying, "That the extracting of a tooth did not hurt." "It does not hurt to have my teeth filled." But such cases, as you all know, are rare. By far the greater number of patients cringe at the first touch of an instrument to enamel, frightened before being hurt, moan and squirm at contact with sensitive dentine, weep and shiver, and grow hysterical, exhausting their own strength and that of the operator. It does not matter whether the suffering is imaginary or real. To the operator at least it is real. What operator is there that has not had his sympathies awakened by the child patient saying, "Now doctor, will it hurt? Have you got to use the buzzer?" And from the older ones, who has not heard, "Oh Doctor, I like you out of your office, but I hate to come for work. I hate your instruments. It just makes me sick." Who among you gentlemen have not, times without number, needed the poetized patience of Job while striving not to hurt, and accomplished little. But I need not dwell upon this. It is a more than a thrice told tale.

There is a view of this question that was recently presented to me in a forceful way. In a casual conversation with Rev. Dr. Lawrence above quoted, it was claimed the dental profession was a long way in the rear of surgeons in the matter of the avoidance of pain in operations. The Doctor said: "Yes, it is true, you are not up to the level of surgery in pain avoidance. There is a brutishness of persistence in operating that in the public mind stamps the dental chair as a place of torture to be avoided until driven to it as a last dreaded resort." The charge is true. There was terse irony in it, a logic unanswerable.

What would be thought of a surgeon who in the light of to-day should perform laparotomy without an anæsthetic. You would all say he was a brute, and his operations, however skillful, brutish.

We are amputating nerves, performing laparotomies on the bodies of teeth, disemboweling them, causing groans, entreaties, tears, shock often to syncope, sometimes collapse. Only week before last a young gentleman, on whom I was operating, fainted (having declined the help of chloroform). After resuscitation was complete, I said, "This will not do; if I operate for you, you must take chloroform, else I shall decline to serve you." "Is it safe?" "Yes, unsafe without it." "Then I'll trust you." From thence to finish the operation was painless, but consciousness was not for once suspended. On leaving the office he, with a pleased look, said "Doctor, next Monday I'll take the chloroform, it does not hurt." Whether he referred to the anæsthetic or the operation was not explained. In the case of children I absolutely refuse to operate painfully. Our profession does not demand baby torture.

Are there then no obstacles to the general adoption of the advocated practice? Yes, we have to sail under false colors, or meet a prejudice in the public mind whenever chloroform is named. It is no easy aversion to allay. It is founded upon recorded deaths from anæsthetics all too numerous, in Chicago and New York so recent as not to be forgotten, but I do not hesitate to say, needless deaths, caused by shock easily avoided, or by excessive anæsthetization. This prejudice, however, can be overcome by use of facts easily demonstrated. Clearly to my mind this should be done, or other means as good or better, sought out and adopted. There is surely in such a body of men as is before me, learning, skill and forcefulness sufficient to such an end. May the time soon come when the seekers for our skill and aid shall not be hindered by dread of "torture;" when to the gentle courtesy and dignified suavity for which our profession is becoming noted, shall be added the charm of skilled and distinguished tenderness; when we can advertise painless operations, not by flaming posters and staring headlines, quackishly and unethically, but by quiet unpretentious putting aside prejudice, by tender humanity, by acts which are benisons, by works which are so beneficent that we may clothe our offices with kindliness as ennobling to ourselves as it is inviting to our beneficiaries.

DISCUSSION.

Dr. A. O. Hunt, Iowa City, Iowa: When the essayist brought up the question of copper amalgam, my name was mentioned in connection therewith, and I desire to state a few things

in relation to it in my own experience, and what I believe to be largely the fault in the use of it. My attention was first called to this sort of filling material by a circumstance of this kind: I extracted two bicuspid teeth from a Scotch woman's mouth that had been in position forty years. The teeth were originally filled in Scotland, and the amalgam did not look like any other amalgam that I had ever seen. It had a deep purplish-black color. All the other teeth in the mouth had decayed and were broken down and these were the only two whose crowns remained above the margin of the gum. The character of the teeth originally was of that class not well organized, of very light bluish white in color, yet the fillings were in perfect contact with the walls of the cavity and had preserved the teeth up to that time without any discoloration of tooth substance. The two first bicuspids were filled when the person was very young. On examining these carefully and thinking about it—this was some twenty years ago—I began to look for this filling material, or to find out what it was. I wrote to Scotland and England, and finally Ash & Sons sent me what they called Sullivan's cement. It is copper amalgam presenting a peculiar purplish black color in the teeth. I used it for a number of years in the cases where indicated but finally had to quit using it, for the simple reason that it was difficult to obtain at all times. Later, as the copper amalgam came into use more prominently I was in favor of it and began to use amalgam manufactured by different individuals. I did not, however, get the results from these new amalgams that I had obtained from the use of the Sullivan cement. Then I began to look for the reasons, and decided it was because there was a surplus of mecury left in the latter amalgams that had not been worked out. Then I became acquainted with Dr. Hewitt's copper amalgam; he gave me some of it to use. I found with this there was too much mecury remaining in it to please me—as I work all amalgams dry. However, the amalgam set readily, formed a good compound, and would discolor, still I did not believe it was in its best possible condition. I asked Dr. Hewitt to prepare some for me "extra dry," expressing all the mercury from the compound that was possible, which he did. With it I have had most excellent results, that is, it is the only copper amalgam that I have ever used that gives me the same results that I obtained from Sullivan's cement. Fillings that I made some six or seven years ago with this material are still retaining that deep purplish-black color to

which I have referred. Copper amalgam is not doing its best service if it does not change color in the mouth. It is the only preparation that I know that will give uniformly good results, if it does not contain a surplus of mercury. I continue to use it in certain conditions, particularly that class of teeth that are poorly organized, third molars that are badly disintegrated, buccal cavities and doubtful cases where we do not expect very much in the way of saving the organ by filling. But I find that the use of copper amalgam, in the conditions named, affords better results and preserves the teeth for a longer time than other plastic filling material.

Dr. Geo. D. Sitherwood, Bloomington: I will only say a few words with reference to that portion of the paper that refers to aluminum amalgam. I have never had success with copper amalgam in my own practice because of its uncertainty or washing away. I have been using Carroll's aluminum amalgam for a year, or since the last meeting of this society. I have been using it as a light colored amalgam. I think the essayist made a correct statement when he said that aluminum amalgam contained only a sufficient quantity of aluminum to keep it a light color. I have been able to manipulate and make very beautiful fillings, so that they can be polished with sandpaper discs similar to a gold filling. It is a better conductor than either gold or silver, and you have to line the cavities in places where the pulp is nearly exposed with some nonconductor. The conductibility of aluminum is so great that sometimes it is an uncomfortable filling. I prefer it to any copper amalgam filling I have thus far been able to find.

Dr. Ingersoll: I have ofttimes been impressed with the the fact that many of our medicaments and processes of operation were failures because of lack of exact methods. While listening to the paper which has been read, I have been impressed with this more and more, and I said to myself it is method, method, method, and a failure in method means a failure in an operation as much as a failure of using the right instrument or right medicament.

I know it has been said with regard to chloroform—and one of its strongest opponents is the superintendent of the Massachusetts general hospital—that it is essentially a poison and ought not to be given. He is an advocate of ether. I have claimed that much depends upon the *method* in which it is given. It must be administered in such a manner as to produce no shock. I would not dare

to give it as I have seen it given by some practitioners. A proper method of its administration has been stated by Dr. Hewitt, although different from my own method. Our *methods* of administering medicines, and our *methods* of operating have much to do with the results. In this connection I will speak of a *method* in the use of the knife and of the use of antiseptics. It is common for a surgeon to require a sterilized atmosphere, and under favorable circumstances he sterilizes the atmosphere in which the operation is performed. Without a sterilized atmosphere he uses some antiseptic after the operation is completed. Now, it makes a vast difference whether he uses it after or during the operation.

I had occasion a year and a half ago to remove a fibro-sarcoma of twenty years' growth, situated between the lateral incisor and the cuspid in the lower jaw. It was attached to the periosteum. I did not know to what extent it had affected the bone and alveolar processes until removing the soft tissue, but anticipated necrosis. I had been taught that to remove such a growth was always a dangerous operation on account of hemorrhage, and especially where there was necrosis. I undertook a new method of operating. I used as an antiseptic a fifty per cent dilution of aromatic sulphuric acid, and instead of waiting until I removed the growth, at each cut of a half inch I used a swab saturated with the antiseptic and drew it through the wound. The line followed by the knife was about five inches. There was very little hemorrhage, no soreness, swelling, or pain following the operation nor thereafter. The wound healed promptly, although I dissected out the intervening necrosed bone down to the base of the jaw. I was surprised myself at the success of the operation. I consider that my success was largely attributable to the method of operating, following the course of the knife with the sulphuric acid. I have since tried it in similar cases and find that my success is much better than formerly.

Dr. T. L. Gilmer, Chicago: I have not a word to say to the older members present, but I desire to speak a word of warning to the younger members. Dr. Hewitt may be able to administer chloroform to his patients at all times in such a manner as to render it safe. There is much in method as Dr. Ingersoll has said, but I want to advise you when you go home not to use chloroform as an anæsthetic, because you do not possess the skill and method that Dr. Hewitt seems to possess, judging from his paper. I do not say

that Dr. Hewitt may not be able to use chloroform and use it safely, but you cannot do it yet. Wait until you learn from Dr. Hewitt or some one else how to administer this drug with immunity from danger before you attempt it. Letters from ministers do not amount to anything on subjects of this kind. They know chloroform administered, relieves pain, and we know that. We also know that the testimony of physicians is not alway the very best. The men referred to are men of high standing, but we know that physicians are sometimes very careless in the indiscriminate use of anæsthetics. We know that chloroform when given in the very safest manner possible kills more patients in the dentist's chair than all other anæsthetics together. We have much evidence to that effect, and we also know that it kills during the first few inhalations. At this time many practitioners are looking for something that will obtund sensitive dentine and will welcome anything which will give the desired result. Some of you, gentlemen, if you resort to the administration of chloroform for this purpose, will surely come to grief, as no court will hold you blameless, no matter how carefully you may have administered it, if death results, should the operation be done in the sitting posture and for so trivial an operation as the excavation of a cavity of decay in a tooth.

Dr. C. A. Kitchen, Rockford: Right in line with Dr. Gilmer's remarks, the older members of the society will doubtless remember that when we met at Chicago, in 1865, to organize the Illinois State Dental Society, we were invited to the Eye and Ear Infirmary and heard a very able lecture by Dr. Hildredth, who was the President of the institution. I never heard a better lecture on anæsthetics than he gave at that time. Some of you will also remember that within two years after that Dr. Hildredth was found dead from chloroform. He was in the habit of taking it to induce sleep. A man of his prominence losing his life by using chloroform about in the same way as recommended should teach those of us who know so much less about it to be very cautious.

Dr. C. N. Johnson, Chicago: I did not intend to say anything on Dr. Hewitt's paper. It is true that we should have, if we can get it, some painless method of operating upon our patients. I do not believe, however, the time has come when we have that, and I feel as Dr. Gilmer does in regard to Dr. Hewitt's paper. While the paper is an able one and is an eloquent plea for the use of chloroform, we must not lose sight of the fact that Dr. Hewitt is an en-

thusiast in this line. I have not the slightest doubt that Dr. Hewitt accomplishes what he says he does. I would place more reliance in what he says than from the endorsements he gets from his patients. They do not count with me one iota, I do not care from whom they come. I feel that the time just now is ripe for a word of caution. There never has been so great a wave coming over the dental profession as there is now. Painless dentistry is a craze. Quacks have sprung up on all sides, and we have nostrums by the thousand. The better element of the profession will be glad when the time does come when we can have some method whereby we are enabled to operate painlessly on our patients. I shall hail that method as cordially as anybody, and there may be elements in the paper that will set us to thinking, that will lead to some reforms on this line. I think it is an admirable paper for the older members of the profession, but a word of warning is necessary for the younger men.

Dr. W. N. Morrison, St. Louis: If we take the words of warning of the last speaker, we will still be in the same old ruts. It is the advance guard that most of us are indebted to in this age. Gentlemen who are the advanced thinkers and young men that have good heads on their shoulders are moving the world to-day. A few years ago we had the old slow mule cars going through the streets, and finally the electric cars came, and it was said that they were perfectly incompatible with human life, and that a large number of people would be killed by them. The electric cars move through the streets to-day, and very few lives are sacrificed by them. We are in an age of progress, and if chloroform will assist us in our profession when properly administered, we should use it or anything else. It is the young progressive men that are going to adopt these things and reap the rewards of the profession. We know that the action of this drug is such that the drug itself must be used with care. Do not be afraid to use it and note the results, and give the profession the benefit of them.

Hans Block: I feel that we are deeply indebted to the author of the paper for the hints which he has given us, and I am pleased to note the sympathy which the doctor exhibits for his patients. To avoid pain wherever we can is one of the most sublime laws that we ought to follow.

With regard to obtunding the tissues which surround the teeth in order to avoid pain in extraction, many things have been tried.

The simplest thing is the hypodermic injection of distilled water, because there can be no danger attending its application. I do not think it has been used sufficiently to say that it is inferior or superior to other methods in obtunding sensitive tissues. I must confess that I learned a useful thing for obtunding sensitive dentine from Professor Litch. He thinks the most perfect method for this purpose is the evaporation of chloroform. He has an appliance for this purpose which costs $25.00, but I believe you can make it yourself for 50 cents. Professor Litch recommends it to students, saying that he uses it daily and that his patients have to suffer no pain during excavating.

With regard to copper amalgam, I did not hear the essayist and the first gentleman who opened the discussion speak of the method of triturating copper amalgam. I should like to hear something on this point. A gentleman in an article quite recently said that we should grind it vigorously, otherwise it is of no use. Another says, do not grind it, for the more you grind it the more will you remove the mercury, and then it is not copper amalgam any more, but simply copper, and that cannot stand. I would like to know which method is the right one.

Dr. Black: I do not wish to say much in regard to this paper, and will only speak to the point of the use of chloroform. I have used anæsthetics a great deal and for a long time. The use of chloroform in this way has come up over and over again within my memory and been abandoned. Every surgeon knows that operations about the mouth and face, particularly those about the mouth, are the most dangerous operations for the use of anæsthetics. Furthermore, the position of our patients in our chairs, sitting up as you saw here to-day, is the most dangerous position for the administration of anæsthetics. The evidence derived from accidents of chloroform also show that the first inhalations of chloroform are the most dangerous points in its administration. Gentlemen, I would not throw a stone in the way of advancement; I would not throw a stone in the way of discovery of a means to obviate pain during our operations. Such a means we all desire; but I would repeat the warning that has been given here that we be careful as to the use of chloroform, for we have in it a danger that is liable to land some of our young men in the penitentiary, as has been said. Gentlemen, I give you warning now, that if death occurs under such circumstances the courts will hold you

responsible. The evidence that will be given before the court would be such as to hold you responsible, at this day, at any rate. These accidents do not occur very often, but when they do, they are deplorable. The facts are, this anæsthesia can be had, as has been stated. I have given chloroform in this way myself years ago. There are others of the older men of the profession who have given it in this way. This craze for the use of chloroform in this way passes over the profession in this or that locality from time to time. Another point: A man is unfortunate—a young man particularly—who has gathered about him a clientele demanding this kind of thing. The time will soon come, if the history of the past tells us anything of the future, when he will wish to be clear of patients who demand the use of chloroform, and then he will have difficulty. He may have had no accident himself, somebody else has, and he will wish to avoid it. His patients may demand it, not knowing the danger attached to it, and in this way he will have trouble even though he has met with no accidents himself. Its use is to be avoided because it hurries operations and leads to careless operating. All these things condemn chloroform for general practice. I do not say that it cannot be used in the way Dr. Hewitt says he uses it. Certainly it can, and good results can be obtained. It is a nice point to operate at the right moment, and not give a large amount of chloroform. There is very little danger aside from the first danger that occurs at the beginning of the inhalation. There is danger from the continuous use of chloroform, or carrying the anæsthesia too deeply with chloroform, ether, or any other anæsthetic.

Dr. Harlan: I did not expect to say anything this morning, but if I had said anything before anybody else had spoken, I should have said a few words about the danger of partial anæsthesia, particularly from chloroform. Those of you who have read the statistics of deaths from chloroform will find that the newspaper accounts pretty generally say, that after three or four whiffs of chloroform the patient fell back in the chair or suddenly collapsed. Now, when a record of sudden deaths occurring from the administration of chloroform is presented to us, it seems to me that we ought to be very careful about producing partial anæsthesia to the obtunding stage with an agent of this character, The real danger lies in the cessation of the function of respiration on account of the paralyzing influence of the anæsthetic; at least that is one of the

principal dangers. A few years ago I attended a meeting of the Indiana State Dental Association, and one of the members (I do not remember the name just now) said he had found great satisfaction in having patients inhale chloroform for the purpose of enabling him to cut sensitive dentine. At that time I uttered a word of warning in the pages of the *Dental Review*, and I took occasion to look up the statistics with reference to deaths from primary anæsthesia by chloroform at that time, and since then I have been very much opposed to the production of partial anæsthesia.

With reference to the formula that was presented by Dr. Hewitt in his paper for local anæsthesia, I should think with the addition of a larger quantity of atropine that it would be improved because if I remember rightly, there were twenty grains of hydrochlorate of cocaine, and only one-tenth of a grain of atropine. If half a grain or even a grain of atropine were added to the formula it would be still more effective. This, however, is purely speculative at this time.

The other question asked was with reference to the quantity of hydronaphthol. There would not be any danger from its use anyhow, and I do not know why it would not prevent any inflammation of the tissues from the introduction of a syringe into the soft tissues. I consider betanaphthol much better than hydronaphthol for the reason that a larger quantity of it is soluble in water. Hydronaphthol is soluble in water to the proportion of about 1 to 1100, and betanaphthol is soluble in water in the proportion of 1 to 550.

Dr. Hewitt asked a question in reference to the effect of cocaine upon the heart, whether or not hydronaphthol in the amount he had introduced would self-limit the action of the cocaine and prevent its going to the heart. I should say that the result, if that was the object of the introduction of hydronaphthol into the formula, would probably be better obtained by the use of betanaphthol. It is an absolutely pure chemical product, although that is not saying anything against hydronaphthol because it is a very useful drug, but it has some impurities in it that the betanaphthol has not, and it makes a perfectly clear solution when the other is somewhat reddish, especially after exposure to the atmosphere.

The interesting exhibit of labor-saving appliances I was very much taken with, and I feel that the doctor ought to be congratulated for his efforts to render operations on the teeth and around the mouth much simpler than they are frequently done from a lack of the possession of necessary appliances of that kind.

The question of spraying the mouth with antiseptic solutions containing cocaine, I doubt the propriety of, for the reason that several cases of the cocaine habit have come to my notice, more particularly from dentists, where they have suffered little ills, and where they were worn out with fatigue they have become addicted to the use of cocaine, and I would simply utter a word of caution in that respect. If I was going to use cocaine around the roots of teeth or on the gums, I would confine it to those three or four teeth and not spray the whole mouth.

With reference to making a solution of cocaine that will be absolutely stable, the doctor was slightly in error. I know a few years ago solutions did decompose because there was a fungus that could be found in a four per cent solution after a short time, and if carbolic acid was added then it had the odor of carbolic acid. One-half per cent of boric acid ($H_3 Bo_4$) in water will preserve a cocaine solution and render it absolutely antiseptic. I have solutions of that kind that have been in my office for fifteen months, and they not only show no decomposition, but they show no growth of any kind in the solution.

One word with reference to boracic acid. Boracic acid, the old formula, you are all familiar with, especially in the impalpable powder that is used by surgeons. Boracic acid is a new product which is described in Helbing's modern Materia Medica, it has the formula I have indicated. It comes in clear, hard, large-sized crystals, and is soluble in water in one part to sixteen. I had a chemist in Chicago try in several ways to see if he could not dissolve more of it and he failed, but between sixteen and twenty-five it is freely soluble, so that you can make any solution you like. You can make it still more attenuated between sixteen and twenty-five, and depend upon the absolute chemical purity of it. It is soluble for all purposes of disinfection of instruments.

Dr. McIntosh: It is generally considered that a combination of chloroform, alcohol and ether is much less injurious in its effects and less dangerous. Why could not that mixture be sub-

stituted for the chloroform? It is as successful in its action as chloroform alone and is considered less dangerous.

Dr. Harlan: The A. C. E. mixture is used very much in the London hospitals. I think recently, or at least within the last few years, they have been using it in the hospitals of Vienna. I am not exactly positive with reference to the use of the A. C. E. mixture in Vienna, but after the conclusions of the Hyderabad Chloroform Commission were published there were comparative statistics with reference to the value of various anæsthetics, and at that time it was stated the favorite anæsthetic was the A. C. E. mixture, and it was gradually gaining ground on the continent. About three weeks since I read an article on the subject of "The action of chloroform on the heart," by one of the surgeon-majors in British India, in which it is stated that death from chloroform does not take place in consequence of its direct action on the heart; consesequently if it does not, it must act on the respiratory system, and any anæsthetic that acts primarily by paralyzing the respiratory centers must necessarily be dangerous.

Mr. Block: Did you ever hear of Dr. Hayes' apparatus in which he uses chloroform?

Dr. Harlan: I have never investigated Hayes' method scientifically, but I know there is such a method.

Dr. H. H. Townsend: I am inclined to think chloroform is chloroform no matter how you use it. In regard to the A. C. E. mixture mentioned by Dr. McIntosh, I will say, that while it is undoubtedly safer than chloroform alone, it is not without danger. The last winter I was in medical college we had several cases under its use, that were quite alarming, although these patients were examined prior to its administration, and no reason found why the anæsthetic should not be given, yet they came near being fatal. One case in particular was pulseless and without respiration for perhaps ten or fifteen minutes, but by the use of hypodermic and rectal injections, artificial respiration, etc., the patient was finally resuscitated.

In the early years of my practice it was quite customary to use chloroform for the extraction of teeth, and I frequently had physicians come to my office and administer it for me, and the doctor who was usually called, had used chloroform so much in hospital practice that he felt safe in giving it, until we came near having a fatal case in my chair, when he lost confidence in his

ability to administer it. I have not allowed it to be given in my office for many years.

I have heard experienced surgeons say that it was impossible to tell when it was safe to use chloroform and when not.

I was glad to hear the words of warning by the preceding speakers, and fully concur in what they have said.

The essayist spoke of surgeons censuring us because our operations were not as painless as theirs, and comparing laparotomies to the extraction of teeth. I must say I think the comparison a poor one, and the censure unjust. No surgeon of the present day would be justified in performing a laparotomy without the use of an anæsthetic, while a dentist is hardly justified in using an anæsthetic (unless it is nitrous oxide) for the extraction of teeth.

In regard to the gilling twine mentioned by the essayist, I think if the doctor will use floss silk instead he will not need to apply a local anæsthetic before using it, besides it will go between the teeth where the twine will not go.

I desire to emphasize what Dr. Gilmer has said about digestion and assimilation. Of course proper food is essential, but many times, and especially during pregnancy, the most healthful diet cannot be digested, much less assimilated. Fresh air, sunlight, out door exercise, are valuable auxillaries, but it is often necessary to supplement these with appropriate systemic treatment.

In those cases of rapid decay of children's teeth I have seen the most beneficial results from the administration of Calcarea Phosphorica, or lime phosphate, in attenuated doses, four times a day.

I have not only seen a marked improvement in the general health, and weakly children become robust and healthy, but have seen decay of the teeth entirely arrested, and what was white, soft decay turn brown and harden, and teeth that were so exceedingly sensitive that it was with the greatest difficulty that they could be excavated sufficiently to hold a temporary cement filling, lose all abnormal sensibility so that gold fillings could be inserted with comfort to both patient and operator.

Dr. G. Newkirk, Chicago: I have not heard any criticism on copper amalgam. Having had considerable experience in its use, I wish to say that it has been with me quite unsatisfactory. I care not how you mix it, or how you perform your operation, your experience in the course of years will be unpleasant. With

rare exceptions, we would better let copper amalgam alone. It will discolor the gold fillings that are in the same mouth, and discolor the teeth themselves. We get different results in different mouths, so cannot tell what to depend upon when we use it. It is an experiment every time, and in this is unlike other amalgams. With the exception of perhaps a few buccal cavities in frail teeth, after having employed it for several years, I have no further use for it.

Regarding the chloroform question, the fact that Dr. Hewitt or any one else has used it in this manner and has had no evil results in even ten thousand cases, does not prove that he will not have evil results next week, or that somebody may not be killed perhaps by it. The percentage of deaths from the use of chloroform is always comparatively small. A man may have exceptionally good luck, and may use it all through his professional life without accident, and die using it, as Dr. Hildredth did. Another point: The use of chloroform in this way will have a tendency to create an impression in the public mind that it is a trifling matter. Patients will say to you, that Dr. so-and-so does it. He simply takes the bottle and passes it before the nose, and performs dental operations painlessly. I will get a little bottle of chloroform, and when I am suffering pain, will use it in like manner. The result in time will be that we will have many deaths.

Dr. Sitherwood: I would say to Dr. Newkirk that what he speaks of has happened already. The chloroform habit is entirely too much in vogue at present. Only last week a lady came to my office who had been inhaling chloroform constantly for two weeks from an open vial to relieve pain. Am in hearty accord with the words of warning by Dr. Gilmer with reference to chloroform. If chloroform is used promiscuously the habit will be formed the same as the cocaine and morphine habits. Whenever patients experience pain they will use chloroform, and the chloroform habit will be formed and great injury result.

Dr. H. N. Edwards, Des Moines: I am very glad I placed myself in the position of a patient and inhaled chloroform as administered by the doctor, but at the same time I would not do it in the hands of some other men. There is not a man probably in this house that would have given it in the same way. I have been prejudiced from the first to the use of chloroform. My father gave it for fifteen years nearly, though at last he had two or three cases

that came very near being fatal. He thought he knew how to use it. From that time I made up my mind that I would never use it. I have extracted teeth with it in one case, and I have never allowed it to be given in my office. I have gone to the other extreme. For the last year or so I have been endeavoring to get some other anæsthetic. My idea of an anæsthetic is a local preparation, and one that we desire to get; but it seems to me Dr. Hewitt has given us some excellent advice in regard to the method of administering chloroform. He has tried to impress that upon our minds. I know a good deal depends upon the manner in which cocaine is used. I have used quite a number of different preparations, but I never used a preparation on a patient until I have had it tested two or three times in my own mouth. I have used that for months at a time and have never seen any unpleasant effects. In one patient I gave fifteen minims of a five per cent solution before I began to see the effect of it. I do not see much difference in using a two, four, or five per cent solution. I have had the same effects. I have used a five per cent solution and a one per cent solution, in the same mouth and I could see very little marked difference in the effects. A great many times I have extracted bad roots without any pain, but I always tell the patient in the chair that I will not promise to do it without pain; that I will make it as easy for them as possible.

Dr. W. A. Stevens, Chicago: You will remember a few years ago there was a craze about the administration of cocaine. At that time I raised an objection to the use of it. So far as the use of cocaine is concerned I am more afraid of it than I am of chloroform. I may say further, that at one time I was considered an expert in giving chloroform and ether until I came very near killing two patients, then I quit. I have not given either chloroform or ether in a great many years. I have another anæsthetic which I sometimes give. The doctrine which has been advocated here to-day regarding the moral influence that rests upon us as dentists in relation to getting the community into the habit of using cocaine and chloroform, I take no account of whatever, because if the same principle was applied to the dental profession it would hurt them all, as a great many of us do not practice what we preach, and more especially in regard to chewing and smoking. We have a goodly number of such men in the dental profession.

The mortality from the use of tobacco is largely in excess of ether or chloroform.

A patient came into my office not very long ago and wanted me to administer an anæsthetic in order to have some teeth removed, and I told her I would not do so unless she secured the attendance of her family physician to administer it. I informed her of the narrow escape in the case of two patients. The physician not putting in an appearance, I said to her, "I will extract your teeth if you will get drunk." She sat in the office long enough to get under the influence of whisky. I extracted the roots of fourteen teeth for her, and she went home feeling good. That woman has not taken to drinking of whisky since. I do not think it created the habit in her of drinking whisky for the relief of pain.

I rise to utter a word of warning as well as the other gentlemen who have spoken in the use of chloroform or ether. I believe there are cases in which we should use it and run the risk. There was a case in my office some three months ago. A gentleman who had been to some one of our profession in the city of Chicago, who had attempted to extract a wisdom tooth and had broken it. The patient went to another dentist and he was unable to remove it, and was afterward sent to me by some friend. I carefully examined the case and I did not think I could remove the tooth as the teeth were locked together. I could get absolutely nothing between them. He had a fistulous opening near the first bicuspid, and another one exactly under the wisdom tooth. You could run a probe in either way. He finally came to my office on a Sunday, was put under the influence of ether by his physician, and was in that condition for two hours. I managed to remove the root of the wisdom tooth with sharp burs, and the patient is well to-day.

Dr. McIntosh: I will say to those who are fearful of using a three or four per cent solution of cocaine under the gum, to keep adding distilled water to the solution when you make the injection, and see what the results will be.

Dr. Gilmer: In my previous remarks I intended to have spoken of another point, but I forgot it. If you will study the literature on the subject of anæsthetics and medical jurisprudence, I think you will find that you take a great risk if you administer a general anæsthetic of any kind without a third person in the room. This is true in all cases, but especially so if the patient be a woman. If any of you are in need of a book on dental jurispru-

dence, I can recommend the work of Dr. Rehfuss. It is the best of the kind, and treats very fully of the responsibility of the dentist in the use of anæsthetics.

Dr. E. K. Blair, Waverly, Ill.: Neither the essayist nor those taking part in the discussion have mentioned that which seems to be of the greatest importance. We should so conduct our business as to merit and secure the confidence of our patients. Nothing will aid us in accomplishing this end so much as a very careful and judicious course pursued in the use of anæsthetics.

Like many of you, I have given this matter careful study. We all unite with Dr. Hewitt in hoping for painless operations, but I verily believe no well managed office is ever turned into an operating room for the general administration of anæsthetics. You will be discreet if you request the patient to permit a physician to perform this service, and still more discreet if you require him to supply his own operating room. This will demand more time possibly, but your patient will better appreciate the character of this very dangerous operation if you regulate your fee in accordance with the time consumed.

You cannot administer and extract at the same time with safety. Let me say to the younger members of the profession present that you will, in case you lose a patient under these conditions, find it a difficult matter to convince a jury in any court that it is possible to perform this double service single handed. There is a legal as well as a professional aspect, and they are not in conflict with each other if the proper course is pursued.

Let me utter this word of warning, that the promiscuous use of all anæsthetics is fraught with danger to both patient and operator; and whilst I will hail with delight the discovery of the long sought for method of producing the desired result, permit me to urge the utmost care in all our work, both general and experimental. For years I have employed physicians in this capacity, and have no cause for regret, but much for congratulation. Let me cite only one case in point. Some of the members of our profession present are acquainted with the physician who has done my anæsthetic work for a long time. There came into my office a robust, stout young man who wanted one tooth extracted under anæsthesia. The doctor examined him to see if he was a fit subject for anæsthesia, and after a careful examination, saw no reason why an anæsthetic should not be given. The patient was placed

on the operating table, chloroform was thrown into the absorbent cotton in the holder, and the operation begun. After a few breaths of chloroform, the doctor discovered something wrong. The primary examination gave no warning of this impending danger, and without a moment's notice, we found it necessary to resort to the most rapid and radical measures to counteract the effects of this powerful drug. Breathing was finally restored.

Dr. Hewitt: What was the method of administration of the anæsthetic?

Dr. Blair: The anæsthetic was given in the usual manner. The patient took apparently less chloroform than the gentleman did here (Dr. Edwards). I have had considerable experience in observing the administration of anæsthetics by physicians. In some of my cases we undertook to produce only primary anæsthesia, and the result was startling. I have very grave doubts of the wisdom of giving chloroform by the bottle, which I understand is the doctor's method. The patient takes chloroform and exhales it from the lungs, takes one inhalation after another, inhaling only chloroform until he is under the complete influence of the anæsthetic. Let us wait and make sure that we are right. When we have a local anæsthetic that is absolutely safe it will not be peddled about as a nostrum. If it is safe and serviceable, he who discovers it will be a millionaire so quick that it will make your head swim. Always have a physician to give an anæsthetic when it is required.

Dr. Hewitt (closing the discussion): I promised that I would occupy your time but a moment; I will redeem that pledge. First, however, I want to thank you earnestly for the polite attention you have given me, and for your kind treatment in your criticisms upon what I had to say. A word of commendation or of appreciation comes pleasantly, and criticism when it is given in the spirit that it was this morning is just as welcome, and I thank you for it.

There is one thing I want to say in defense of the position I took with regard to chloroform, and that is this: It is hardly fair for Drs. Newkirk, Johnson, and Gilmer to urge against it the death rate of chloroform given in a different way from which I urge. If I knew any words in the English language that were more forcible to convey caution against shock and complete anæsthesia in dental operations, I should repeat them and ring it in your ears, but I do not know of any stronger language than I used

in my paper. Where you have peripheral nerves spreading out from twelve to fourteen hundred feet, springing from the ganglia of the trigemina, and the medulla oblongata you have dangerous ground to tread upon. Apply sufficient shock to these nerves, you may carry your patients over the river, and you cannot bring them back. I say again. I thank you for the caution you gave, but I feel safe in saying that I am not talking to a lot of rattle-headed schoolboys. In looking over this convention I see men of brains, of thought, and I believe that if they adopt the method I have mentioned of giving it, they will safely try it, that is, place the bottle so far below the nose that the patient first inhales the chloroform, and yet hardly gets the odor from it. Gradually steal past the nerve sentinels that lie so close to the medulla oblongata and trigemina and the other nerves spread out on so large a surface. Do not give your patients a shock; do not kill them at once.

Just one word with regard to the position I hold in relation to giving chloroform. I never will allow any man to give chloroform for me in my office unless he will follow my instructions perfectly. If he will do that it is all right. So long as a cone or mask is made, or a towel is taken and thrust down on the face of the patient for the purpose of giving an anæsthetic, so long will we have deaths. It is murderous; it is inexcusable, and I wonder why more men, women and children do not die from the way in which chloroform is administered.

I ought to have added a word of caution with regard to cocaine. I really feel a great deal more fear about that than I do chloroform. I do not believe you can kill a human being using chloroform by the advised method. I am not afraid to trust it in your hands, and *if you will follow my directions* I will take the anathemas that would come thick and fast if an accident occurs. Chloroform acts first upon the nerves of the Schneiderian membrane taken through the nose, then upon the peripheral nerves that are spread out upon the bronchi and the lungs. It then passes into the general circulation, is taken up by the blood, and goes around hitting every nerve it finds. There is a ganglionic nerve that controls respiration, and you can stop your breath but a little while. Nervous force impels breathing. When you anæsthetize the ganglia controlling respiration you carry the patient over the river. When you put the nerve to sleep that causes the impulse of the heart to beat, then you take your patient over the river, but I say to you do

not carry the effect of the drug to that point. It is not necessary.

One word in regard to shock. Shock always arises in my opinion from chloroform and not from the knife. I have practiced my present mode for over thirty years off and on; I have performed many operations, small and grave ones, when the patient was perfectly competent to look at me and see me cut. Shock of the knife is not there. When surgeons tell me that, I laugh at them. When writers tell me that the shock of the knife kills under partial anæsthesia, I simply say I know better. It cannot be proven.

In regard to the use of cocaine, if you use the pigment I have recommended be careful and not let the patient swallow it. I use wax to confine it to the point, because it is a twenty-four per cent solution, and half a grain or a grain is all that should ever go into the stomach at one time.

HISTORY OF THE PROGRESS OF DENTISTRY IN THE WEST.

By J. Taft, M. D., D. D. S., Cincinnati, Ohio.

I have been asked to write on the History of the Progress of Dentistry in the West. This is not an easy thing to do, for various reasons: First, because in this, as in almost everything else, it is impossible to isolate the west from other parts of the country, so thoroughly are the different portions of the country interwoven and interblended that it is impossible to separate anything, so that it may be said this belongs exclusively to any specified territory, and particularly is this true of all that pertains to human progress. Second, it is not quite settled as to where the west is. As is generally conceded it is toward the sunset, but its eastern boundary has been upon a sliding scale, dependent upon the location and views of the persons considering the question. But for our present purpose there need not be much difficulty in deciding the question, where is the west? Since considering this subject we must go back to the time when the west, so called, embraced by far the larger part of our country.

In the time that we can now devote to this subject little more can be done, than to make a brief reference to a few of the points that stand out most prominently in the history of dentistry in the west and comparing the beginnings, as found seventy years ago, with the present status of dentistry we can at a sweep gather something of the progress that has been made, the extent of its growth and the outreach which it has made in this time.

In the first place, we may for a moment turn attention to the pioneer work in dental practice in the west. Those who introduced it did so without any of the aids and helpful instrumentalities upon which we now so much rely. Very little, indeed, was known of dentistry in the west over sixty years ago. If we turn to Ohio sixty years ago, when that part of the country was really of the west, very few dentists will be found, and the numbers become less as we look from that point still further west. However, a

beginning was made about that time in the central portion of Ohio from which great results have been realized, the outreach of which has extended all over this broad land.

Of the few men engaged in the practice of dentistry in that State at that time were Chapin A. Harris, who resided in the year 1827 in Greenfield, Ohio, engaged in the practice of medicine. In the year 1826 Dr. John Harris, a brother of C. A., and the late Dr. James Taylor, resided in Bainbridge, Ohio. The latter a student of medicine with Dr. C. A. Harris. Dr. John Harris had some knowledge of dentistry which he imparted to Dr. Taylor. Together they entered upon the practice of dentistry, part of the time in Greenfield, the home of Dr. C. A. Harris, and there and then did Dr. Harris conceive the idea of taking up the practice of dentistry. After studying, working, and practicing with his brother and Dr. Taylor, in Greenfield, for about one year, he removed to Bloomfield, where he practiced dentistry and medicine for about two years, at the expiration of which time he removed to Fredericksburg, Va., where he attained such success in dental practice that he wholly abandoned the practice of general medicine. His success here stimulated his ambition and he was not long content in Fredericksburg, and after being there about a year and a half he removed to Baltimore, Md. Here it may be said, his great work for the profession began. What had gone before had been preparatory only to that which he was to accomplish in the future.

He did not enter the profession according to the present custom; he simply took hold of a few points and facts and built upon them and continued to build until a great and almost marvelous change was effected. Dentistry was not then a profession, but a confused, chaotic, unsystematized and very circumscribed calling, which was adopted by a few and followed chiefly in an experimental way. Very little was done at that time in the way of improvements with full confidence as to the outcome. To develop and work out the possibilities that these three men saw in this line of medical practice seems to have been the impelling power pressing them on to higher and higher attainments.

Dr. Chapin A. Harris was largely instrumental in the inauguration of three powerful agencies for the development of the science and art of dentistry, and for bringing it into a position and condition entitling it to be ranked as a profession, or rather as a

department of the profession of medicine and surgery. To Dr. Harris is due the credit for the establishment of the first dental college in the world, and also for the inauguration of the first dental periodical in the world. He also added far more to the standard literature of dentistry than any one who had preceded him. Of him it may with emphasis be said, that whatever he did was grandly done. The results of his work have been, are, and will be felt not only in all the States of this country, but in all the countries of the world, where dentistry is practiced and known. It is true that a great proportion of Dr. Harris' work was not done in the west, but he was a western man, and for this, together with the fact that all honor is due to him, I make this brief reference.

Closely allied with Dr. Harris in all his special plans was the late Dr. James Taylor, to whom reference has already been made, and especially was this true in regard to college work. It was at one time contemplated that Dr. Taylor should be associated with Dr. Harris in the establishment of the college at Baltimore, but not seeing his way quite clear to go east he decided to remain in the west and make Cincinnati his home. The thought of establishing a college in the west was ever in his mind after he and Dr. Harris had planned for such an institution, and Dr. Harris' success only stimulated and incited Dr. Taylor's determination to found a dental college in the west. This he, with the aid and coöperation of Drs. John Allen, Melancthon Rogers and Jesse Cook, succeeded in accomplishing in 1845.

It is not the intention here to enter upon the history of these institutions, but merely to refer to them as the first two dental colleges in the world, the one in the east, the other in the west, the conception of both originating in the mutual devisings of the two persons first mentioned in this paper. The influence of both of these institutions, and especially the latter, has been very great throughout the west. Within a very few years after the organization their graduates were to be found in every place of any considerable importance throughout the west, and it is, in a large measure, such alumni as these who made the history of the profession in the west.

After these institutions had definitely passed the point of their experimental existence, the idea was entertained of organizing other similar schools in the west. In 1866 the Missouri Dental College was organized at St. Louis, Missouri; Dental Department

at University of Michigan, 1875; Indiana Dental College, at Indianapolis, in 1879; Kansas City University, Dental Department, in 1881; Dental Department of California University, 1881; Chicago College of Dental Surgery, in 1882. We will not now stop to enumerate further, but simply say that a large number of dental colleges have been organized in the west within the last fifteen years. The influence of these institutions in developing the profession, in establishing it upon a firm foundation, in broadening its usefulness and commanding the regard of the world is beyond any definite computation. The demand for and the growth of institutions of this kind is a clear index of the progress of the profession. Their influence has been, and is being exerted not only in the west, but throughout this land, and, indeed, in all civilized countries of the world.

Dr. Taylor, like his eastern confrère, early saw the importance and realized the value of a periodical literature, and through his efforts and influence *The Dental Register of the West* was established in 1846, and was published and edited by him for nine years. The *American Journal of Dental Science*, edited by Dr. Harris, at Baltimore, and the *Dental Register*, edited by Dr. Taylor, at Cincinnati, were the first two dental journals in the world. The influence of journalistic literature for the development and upbuilding and progress in all departments of human occupation is now so manifest that the bare mention comes with sufficient emphasis to the mind of every intelligent person.

As the profession grew in numbers and in the outreach of its capacity, additional means of communication became necessary from time to time. Other journals were established in the west and have maintained their position of usefulness and power. The *Missouri Dental Journal* was first published and issued in 1869. The *American Dental Review* was issued at St. Louis in 1858. The *Archives of Dentistry* in 1865. The *St. Louis Dental Journal* in 1868. The *Texas Dental Journal* in 1883. The *Dental Review*, of Chicago, in 1886. These dental journals have all been called into existence by demand for them in the profession, as avenues of communication of thought, ideas and practice, and, indeed, of all things pertaining to the profession. No satisfactory estimate can be made, or even proximately attained of the influence of these agencies in promoting the growth of the profession.

I have above referred to these two pioneers, not because there

were not others who are worthy of mention, but because these two stood so prominent in dentistry in the west at that early day. They were the originators of enterprises, institutions, and lines of work which others afterward entered upon and carried forward to a fuller development and more mature fruitage. It is said that men make history, and this is true in regard to all that pertains to human progress. If we have a history of men, we have, in the main, all that pertains to progress of human affairs.

Now the agencies of progress pertaining to dentistry in the west are essentially the same as those operative elsewhere; but these agencies may be used with more efficiency in some localities than others. The pioneers in dentistry in the west were largely from other localities and chiefly from the eastern part of our country. Dentistry was very crude in its early periods in the west, as might be said of it everywhere. But it was under far greater embarrassment here than in the older parts. While there were some thoroughly competent dentists in the early days in the west, by far the larger number were inferior, and many were mere adventurers, with very defective qualifications, and too often dishonest as well as incompetent.

The facilities in the west for obtaining the needed supplies of materials, instruments, appliances, etc., were very meager indeed, as compared with the opportunities afforded in the older portions of the country. The people in pioneer days of the west were, for the most part, not such as would constitute a desirable clientele, nor serve as a stimulus to great achievements or rapid progress. But things did not long remain in this primitive and chaotic state. The elements of civilization were gradually being introduced, were becoming more and more self-assertive. The character of the population passed through rapid changes, constantly assuming a higher type of civilization. While this process was going on, another was taking place, viz., the infusion into the communities of a better class of dentists, and a better and improved phase of practice was the result. This change was of slow growth prior to the introduction of railroads, which event greatly facilitated travel and intercourse. This facility of communication brought rapid changes and progress in all departments of human occupation. Dentistry shared in this ongoing and in some respects seemed to outstrip many other callings.

No agency exercised a greater influence for progress in the

west forty years ago than association work. The Mississippi Valley Dental Society was organized in 1843, at Cincinnati, Ohio. The following named dentists were active in effecting this organization: James Taylor, A. D. Bigelow, James Clark, G. T. Teter, J. W. Cook, M. Rogers, John Allen, H. Crane, Wm. M. Hunter, Chas. Bonsall, B. Strickland, W. E. Ide, all of Ohio. J. P. Ulrey, D. P. Hewitt, F. E. Swire, Wm. R. Winton of Indiana. W. B. Ross, Wm. H. Goddard of Kentucky. A. Berry of Mississippi. S. P. Hullihen of Virginia. B. B. Brown of Missouri. J. B. Ross of Philadelphia. Many other names of prominent men of the profession might be added to this list, but enough are here given to show the fact that the outreach of this organization was wide. And this will be more fully emphasized when it is remembered that a large addition was early made to the membership, consisting of persons from nearly all the western States and many of the eastern States.

Within a very few years after this organization was effected and the value and importance of association work was demonstrated, other societies sprang up in the west. Among the first of these was the Western Dental Society, organized at St. Louis, April 3d, 1856, embracing in its membership such men as Edward Hale, H. Barron, C. W. Spalding, A. Blake, H. J. McKellops, Isaiah Forbes of St. Louis; H. E. Peebles of Lexington, Missouri; W. W. Allport of Chicago; W. W. Hicks of Iowa, H. N. Lewis of Illinois. The membership increased at each meeting, the members coming not only from Missouri but from all the surrounding States. By this means its influence for good was extended over a large territory. The St. Louis Dental Society was founded in 1856 and embraced in its membership the leading members of the profession in that State, viz., Drs. Hale, Forbes, McKellops, Blake Comstock, Leslie and others.

The enviable position held by the dental profession in St. Louis for the last forty years and more, is due in a large measure to the work of these two societies.

The Michigan State Dental Society was organized January 9th, 1856. Its first membership consisted of Joseph Mansfield, C. B. Porter, A. T. Metcalf, S. C. Whitney, H. Benedict, with a few others. Michigan was the first of the western States to organize a Dental Society. Its work directed attention to and elicited the interest of the profession, not only in the west, but throughout

the country. It was, however, regarded generally as an uncertain experiment. Many doubts were expressed as to its success, but it lived and wrought good work. It has contributed its share to the literature of the profession, and was for many years a pioneer in State society work. In its annual meetings it has traversed almost the entire extent of the State, and carried its good influence to nearly every locality. While in many other States these meeting are always held in the same place, this society has spread its influence over its entire territory. It was by the instrumentality of this society that the Dental Department of the University of Michigan was founded, indeed, it is the child of the State society. Through its influence and efforts a law to regulate the practice of dentistry in the State was enacted by the legislature, the execution of which is in a good degree in the hands of the society. This association has always aimed to guard well the honor of the profession in the State. It has ever stood squarely for the observance of true professional and ethical principles.

The Indiana State Dental Society was founded September 18, 1858, in which the following named persons were participants: P. G. C. Hunt, J. F. Johnson, G. Lupton, A. M. Moore, R. H. Hurd, S. B. Smith, J. P. Ulrey, G. C. North, and a number of other prominent dentists of the State. Indiana was the second of the western States to organize a State Society. It has maintained a vigorous condition from the beginning to the present time, and has been a power for the upbuilding and strengthening of the profession not only in that State but its influence has gone far beyond. It doubtless served as a stimulus to the neighboring and other States to do likewise.

After success was demonstrated by these two societies others were led to the establishment of similar organizations until now every State, with possibly two or three exceptions, has its dental society, and they are all working to some degree on lines indicated by these first organizations.

I have here simply referred to these four bodies to illustrate so far as may be the work that has been, and is being accomplished by asssociation workers. Perhaps to no other agency does our profession owe more of its progress than to these just referred to. I here make no reference to our educational institutions, nor specially to the literature of the profession. Both of these have exercised a very great influence in the upbuilding and develop-

ment of our profession. But it may be said that these have been greatly influenced by association work, and it is questionable whether they would ever have attained to any considerable degree of prominence or efficiency in the absence of associative work on the part of the profession. This we regard as in a large measure the foundation and the corner stone of our noble profession. And if we are to maintain the structure in its integrity and still further develop and expand its growth, it will be necessary to look to, and carefully guard this great instrumentality. And there is great encouragement and a prophecy of good for the future in the fact that the profession in a large measure is realizing this.

There are now five distinct classes of dental association work, viz., 1. That more intimately connected with the general medical profession. 2. That exhibited in our national associations. 3. That exhibited in our State associations. 4. That exhibited in district societies. 5. That exhibited in city societies. Each of these is active, in a degree at least, upon different lines of work, differing from the others, but the work of all having a common aim directed to a common point, viz., the development, upbuilding, and growth of the profession.

DISCUSSION.

Dr. Cushing: Mr. President, I do not know what I can say with respect to the very interesting statements that Prof. Taft has given us, except that it is evident the west has had a prominent influence in shaping the progress of the profession throughout the country, and as he says throughout the world. I have some personal recollection of some of the older members in the profession to whom he referred, most of whom have passed away. My relations with them were of a pleasant character, and I can testify to the strong influence that they had upon all who came in contact with them for the elevation of the profession. I used to enjoy many years ago attending the Mississippi Valley Dental Association, which was one of the pioneer organizations, and many of the members of that society were of a character that stimulated and inspired the younger men to go forward and to do better work. We have had a wider influence in the west in the upbuilding of the profession than perhaps is generally thought to be the case.

Dr. Wm. O. Kulp: It is always wise in tracing the history of any society, or progress of any kind, to have some of the pioneers who are still living present; thus the record is more apt to be correct. Within the last few years many of the old pioneers in dentistry in the west have passed away, and it admonishes us who are following in the tracks of the older ones, to put the house in order, and tell the younger ones what we know of the early days of our specialty in this part of the country. In the presence of Dr. Taft, I feel as I did thirty-six years ago when I first knew him. When I was full of ambition and push, desiring to accomplish all that was possible to accomplish in what I undertook. When I entered dentistry, my first advisors were Dr. Taft and Dr. Watt. The latter this year we laid aside. Dr. Allport was another of my staunch friends at that time, and we have also laid him aside. James Taylor, and many others, whom I met then as dental fathers, have been laid aside. When I count the years that have passed since that time, it makes me think I must be getting old, that my place must soon be among the fathers, to be shoved aside by the younger enterprising men. I have not done as much for dentistry as I thought I should when I began it thirty-six years ago. I have not accomplished nearly what I expected to when I began the practice. I had grand ambitions, laudable emulations, but duties to my family and business opportunities lured me from my student paths, and interfered with my plans.

The opportunities for investigation at that time were not what they are now. We had to originate almost everything with which we made any progress. We had to originate nearly all our instruments to work with. The profession had a lock and key on the doors of their offices, as well as their mouths. Whatever a dentist did was done for himself and not for others. Of course, there were a few exceptions, and they were such as Dr. Taft, and others who did wonders in the way of opening the avenues of information It is not more than twenty-five or thirty years ago since we gained access to the private rooms of dentists. Prior to that time, they made it a point not to invite their fellow practitioners to their offices. There was no professional courtesy, no good fellowship with few exceptions. Of course this was discouraging to a great many, but it stimulated me more than if the doors had been thrown wide open. While a medical student, I had the misfortune of having a cuspid decay until the pulp was nearly exposed. Among the

patients of my preceptor was a broken down dentist who came from the east to the western climate for his health. I complained of my tooth when he said he would try and fix it for me. Finally he did fix it, filling it with tin foil.

In a day or two I began to have trouble with it. In the course of a week I could not see out of the right eye. I then said to my preceptor that I would take up the specialty of dentistry, because if I could cure my fellows of toothache, I would do better for them than to cure them of bellyache. He said it was doubtless a good idea. I started in dentistry at that time, getting what instructions I could from our broken down dentist patient, who promised me as he went further west, that if he died he would give me his library and all of his instruments. At the end of about six months, I received an express package. When upon opening it—behold, it was from my old friend. He had died, and sent me his library, instruments, and all the materials he had on hand with his good will. I unpacked the instruments and opened a dental office in my preceptor's office. That was the first start in practical dentistry I had.

Unfortunately some sixteen years ago, all these records were burnt up in a fire. Among these were many letters from the pioneers in the professions which were a great deal of comfort to me, and I sadly miss them. I spent many months in St. Louis, among the dentists, where I obtained a great deal of information from all of them. Among my best friends at that time were Drs. Forbes and Judd, also Dr. Peebles. All whom are now dead. Among the living, I want to give due credit to Eames, Bowman, McKellops and all the rest.

Beginning the practice of dentistry in 1858 in Iowa, I have remained in the State ever since. The State seems to have developed wonderfully while I have been in it, and while I have had great temptations to go outside of the State, I have never felt that I could turn my back on it. It is my home from preference. Whatever I have done to help to bring the dental profession of the State up to its present status, I have done from the love of the State and its people. If we compare dentistry in Iowa in 1858 with that of the present time, it is marvelous to think of, especially for those of us who passed through that era up to the present time. It is not necessary that I shall go over many things, but there are some personal experiences that I have passed through that might be profitable and interesting.

In the early history of dentistry, we found that the great majority of dentists practicing dentistry in the State, were men who practiced it simply as a side show. They were jewelers who spent most of their time in repairing watches and doing a little dental work from time to time. Another class of dentists we had were men who were itinerant preachers, singing school teachers, who had a smattering of dentistry and practiced it along with preaching and music. Others were photographers, who would extract teeth and put in tin foil fillings, silver plates, etc. It was a rare thing to find a dentist who practiced dentistry as a specialty in those days. The larger towns had one or two, prior to the introduction of rubber. After its introduction, a great many sprang up who learned the art of extracting teeth and making rubber plates. That seems to have been their entire ambition. Through the aid of Dr. Forbes, as much as any one, I learned how to contour gold fillings. I shall ever remember the first central incisor I built out, which was broken off in the central proximal surface for nearly one-third of the tooth. I built it out and charged the husband of the lady $15.00 for the work. I never came so near being driven out of town as I was then. I was considered a monster and thief for charging such a price for filling a tooth. Everybody that saw the filling joined in with the husband. My neighbor dentist considered it a piece of advertising. But as I had some fight in me, I concluded to remain and fight it out. The result was, I got more and more of that kind of work from year to year. I often received letters from dentists in the interior of the State, offering me quite a sum of money to give them the secret of the preparation of gold I used to build out these teeth.

Dr. Harlan: I would like to say a few words about the pioneers who went to California, and before I say anything about them I would like to say in Dr. Taft's list of journals started in the west, he omitted to mention *The Dental Jairus*, of San Francisco, and the *People's Dental Journal*, of Chicago.

While I was listening to the remarks of Dr. Kulp, I ran over in my mind the facilities for education and instruction that the dentist of 1855-6-7, had in the United States. At that time there were five dental periodicals published in the United States. There were at least ten original works on dentistry in English. They originated in the United States and a good many smaller ones. There were at least a dozen or fifteen republications of translations from

the French and German. There was a republication of the work of Bell, and various other authors, all of which works were accessible to dental students at that time. Of course, we did not have such an easy means of communication in 1855-6-7, as we have now by means of railroads and extension of telegraph lines; but there were steamboats, stage lines and stage expresses. At that time there were some dental colleges in the United States—in Baltimore, Cincinnati, Philadelphia, in 1855. There was also a dental college started in Syracuse, New York, in 1852 ; a dental college started in the Transylvania University at Lexington, Ky., so that the means of instruction were not really as meager as they seemed to be. Of course in Iowa, which was some distance away from the great centers, it was a little different. At nearly all of the military posts along the great waterways, there were dentists as far back as 1815; there were more than 300 dental practitioners east of the Ohio river, so that for the time there were quite enough dentists to accommodate the population. I think it was John S. Clark who spent his time between St. Louis and New Orleans in those early days in practicing dentistry. The late William H. Goddard practiced in 1832, and the late Dr. Gibbs practiced dentistry in Chicago, in 1833. Another dentist, who died two or three years ago in Chicago, practiced dentistry there in 1835-6. Dr. Goddard practiced in Ottawa, Ill.; he also practiced in Chicago. Dr. Goddard told me that in 1823, the art of swaging gold was not known, but it was detailed in Fitch's Dental Surgery, which was published in 1827, so that after 1845-8, the facilities for the acquirement of knowledge, especially toward the great centers, were very good.

It was in 1848–9 that John Tomes delivered the most brilliant course of lectures that had ever been delivered by any dentist in the world prior to that time, on Dental Physiology. These lectures furnish as good reading as any of the most modern works on physiology, barring the microscopical work that has been done and incorporated in the later text-books, such as Landois', Foster's and other works on physiology. In 1848-9 there were a great many qualified dentists who went to California by way of Panama and around the horn. We have one right in the room who went that way in 1849. I refer to Dr. Cushing. He did not say anything about it, but he practiced dentistry in the early days. It was such men as Dr. Cushing that gave character to the practice of dentistry in the far west. Dr. Blake, who is present with us to-day, went to

California quite early, and he ought to know something about the work of the pioneer dentist on the Pacific coast. I recall the names of a great many. It was on account of the high grade of intelligence, perseverance and the determination to succeed that has given the Pacific slope the high reputation that dentists bear. It was through their efforts on the coast that we have a dental college and that dental societies in the far western country have been organized. Of course, I recognize that in 1856 the Michigan State Dental Society was organized, and in 1858 the Indiana State Dental Society and Western Dental Society. These societies exerted a powerful influence. I feel proud to think that I was born in the west, and that I have lived and been able to associate with some of those pioneers and to learn from them of their early struggles. I want to say to you gentlemen that in order to make your influence felt and help to make history you must do some original thinking and some original work yourselves. You cannot keep up the reputation of any portion of the country without having investigators, without having authors and essayists. Every man has to rise little by little until he can fly across the Mississippi river. If he cannot do that, his wings will grow too large and finally he must swim over. I hope Dr. Blake will say something of the pioneer dentists in California, of whom he is one.

Dr. Blake, San Francisco: I did not expect to be called upon to say anything about the pioneers in dentistry, but as some of the speakers have touched upon California, I think I am the only one left who practiced there. Dr. Cushing has not practiced there lately. I commenced to practice in California early in January, 1850. I left New Orleans in September, 1849, and went by way of the Isthmus, and as Dr. Harlan says, I know some of the old pioneers, but I do not recollect Dr. Cushing. I would like to ask him where he practiced?

Dr. Cushing: I practiced up in the mines.

Dr. Blake (continuing): In speaking of the old pioneer dentists in California, they are nearly all gone.

The first man to practice in California was Dr. Blackman, who came from Virginia, and began to practice early in '48, but he was engaged in practice only a short time, leaving in '49.

Some of those who practiced, kept it up until they made some money and then left. Of the old pioneers. aside from myself, I know of only two living and they are: Dr. Galen Burdell and

Dr. H. W. Cogswell. They have not done any practice for several years. I was raised in New York City and Dr. Burdell and myself were the only dentists in California who hailed from New York in the early days. Dr. Burdell has retired. He owns a big ranch, and Dr. Cogswell has a big polytechnic school. There were but two dentists in San Francisco when Dr. Burdell came there. Dr. Burdell came to San Francisco on the ship "Duxbury," acting as ship surgeon, arriving in April, 1849. His preceptors were Drs. John and Harvey Burdell, well-known New York dentists. Another, an uncle was dentist and surgeon to the Emperor of Brazil. J. L. Cogswell came there in '49, but did not commence practice till two or three years later. He is a brother of H. W. Cogswell. James Birge also came there in '49 but did not commence to practice on the coast until several years later. He has recently died. Speaking of the living dentists, I am the only one left of the old pioneers that has practiced there up to the present time.

Dr. Ingersoll: I cannot add anything to the interest of the subject which has been so thoroughly dwelt upon by Prof. Taft. He has presented the growth of the profession on an educational basis, and I glory in the fact that dentistry has had its rise and progress in colleges, societies, and in the literature of the profession.

Dr. Black: I can only say I have been greatly interested in the paper and in the discussions we have heard. I think it is well to indulge in these reminiscences occasionally, but if Dr. Cushing is only a boy, what can be said of me. I am not yet born. (Laughter.) I am not old enough to talk about these things, and yet I remember a great many of the incidents that have been detailed. I remember something of the societies that met in St. Louis before the war, and I knew quite a number of the dentists at that time.

I would like to speak a word or two as to the work done by Dr. Judd. Dr. Judd's work did not last many years; it was not spread over so many years as a number of other men that have been mentioned. He did not begin so early in life, but his work was vigorous and exerted a powerful influence. He was one of our own members in the Illinois society, and for a long time prominent in the work of the St. Louis and Missouri State societies. I may say he was active in the National and other societies, but not so early as some others.

A word in regard to the facilities for dental education in those days. It is true the books that have been spoken of, and the journals were published and were obtainable; but it is also true that through the west they were unknown, and consequently unobtainable. Even the older dentists in the west, as I personally know, did not know of the books, and so far as their influence in the west is concerned at that time, they might as well not have been published. There were books if we had known how to obtain them. There were quite a number of books not spoken of that were obtainable at the time. The literature at that time was well written. Many of the things related were not useful to us. I think I may say that and not go beyond bounds.

In regard to the dissemination of thought, it has been said that discoveries bring about an advance. That is true. Without the march of information that we get by study, by investigation we have but little progress; but if we have not men who push these discoveries and spread them broadcast, and have an influence in bringing them to the minds of men they will be of little value. They will not influence the masses, and their influence will not be felt.

Dr. J. Taft: There is one phase of former practice that it is well to remember, especially in view of the fact that it would now meet general disapproval, and that is the migratory character of it. In the early days many even good practitioners went from one place to another and practiced. This practice was common in the two decades from 1830 to 1850 and men traveled long distances to practice their profession, and it was regarded as entirely proper. Dr. Chapin A. Harris, his brother John, Dr. Taylor, and Dr. C. O. Cone indulged in this practice. Dr. Goddard also practiced in different places. Sometimes these migrations were made with a view to finding a permanent location, but more frequently with a view of an itinerant practice, because sufficient encouragement was not found in one place to occupy their entire time. It was well from an educational standpoint that the members of our profession did go into different localities and make their abilities known and the possibilities of the profession of dentistry. We have itinerants from that day to this, but they are usually now not regarded with much favor. I think that is a point that we ought not to lose sight of. I began the study of dentistry in 1841. The only book I could obtain was Fitch's Dental Sur-

gery, but a short time after that I was able to get others. The books referred to by Professor Harlan as translations were published in the *American Journal of Dental Science* as a library department to that journal, until these translations and republications were presented to the profession the dental literature was very scarce indeed.

Another thing we should bear in mind is that many of those men who were the most prominent in the dental profession had a medical education. Quite a number of them were men who had been practicing physicians, or who had studied medicine with a view of practicing it and ultimately drifted into dentistry as a specialty. Dr. Harris was one of these men. At that time the greater amount of work that was done in the way of literature for the profession was prepared by men who were medically educated. Many of them were scholarly men. There were men in the early days of our profession who were scholarly, able to translate various languages, and who were cultured in the sciences. The progress of our profession to-day and the high character it bears are in a great degree dependent upon the fact that most of the leading men were scholarly and scientific.

IOWA'S SHARE IN THE HISTORY AND PROGRESS OF DENTISTRY.

By A. O. Hunt, D. D. S., Iowa City, Ia.

In writing a history of organizations or individuals an obstacle presents itself in the form of a difficulty to record in detail all the influences of other organizations and individuals that have assisted in the results obtained. Neither can carry out to a successful termination unassisted any effort having for its object the relief of distress, the education of the masses or the betterment of mankind in their surroundings.

One may be a born leader and yet not be able to call together a following that will allow him to reach any very satisfactory results. So with organizations, those interested locally in the aims and objects for which they are banded together are too often demoralized by dissensions and selfish purposes. When other organizations and other individuals join with them in the movement it at once takes a general character and local pride and laudable ambition become the potent forces in making a special organization carry its part of the burden to the end.

Iowa has been influenced by these conditions during a work extending over a period of thirty years. It is not intended to speak of individuals or point out the special parts they may have had in the work reviewed. Men are but the instruments controlled by a higher power to aid in the advancement of human affairs. To one the angels speak, another is inspired, with others the motive is personal aggrandizement, but no matter what the force may be, its conception was in the realm of the great unknown, and one is thus impelled to go on as long as life lasts, and after this others take up the broken thread and assist in the weaving of the fabric. Completed it never can be.

Iowa has surely done her share in the advancement of dental science, and I shall be in little danger of exaggeration in what is presented for your consideration.

Prior to the organization of this society in 1863, there are few

authentic data to be had. Judging from the rapid growth of the Iowa society in its first years there were evidently located throughout the State, many good and qualified practitioners, but the means of communication at that time was very crude, there being no railroads of any considerable length built at this time in the State. A few of the dentists located in the larger towns thought it would be well to gather the strength of the profession together in a society, and began a sort of missionary correspondence.

The first meeting consisting of only seven members created great enthusiasm, and as we look back at the ideas presented and discussed in the early sessions we are impressed that some of the questions are not yet settled for they come year after year before other society meetings for a solution.

1863. The following were some of the subjects for consideration: Vulcanite injurious to the tissues of the Oral Cavity on account of the Red Oxide of Mercury contained therein. The Use of Anæsthetics. Gold the proper Filling Material (amalgam denounced). Devitalizing Pulp with arsenious acid and Filling Root immediately. Treatment of Alveolar Abscess with Creosote and Iodine.

The requirements for admission to membership were a good reputation. One to be in regular practice, and those who had been students of dentistry for two years. Public meetings were to be the order, for the purpose of educating the people in the importance of the care of the teeth.

This was carried out for the three or four years following, Drs. Allport, Taft, Atkinson and others giving the lectures at various times, until the plan was unfortunately dropped.

1864. Drs. Kulp and Sayles returned from the American Dental Association which met at Niagara, and the American Dental Convention which met at Detroit, bringing with them Drs. Atkinson and Allport, each of whom gave their best thoughts and methods to the meeting.

Dr. Atkinson giving a clinic in the use of the mallet (then new), and one in the treatment of Alveolar Abscess with fistulous opening. Pumping creosote and iodine ("black devil") through the roots and fistula, filling the roots and cavity permanently at the same sitting.

Dr. Allport gave a clinic in the use of blocks and cylinders, a

method comparatively new at that time. He also delivered the public address on the care of the teeth.

1865. This year was a memorable one in many respects. There were more than one hundred dentists in attendance, and this only the second year of its existence; many having ridden by stage four hundred or five hundred miles to be present. The society placed itself upon record, that none should enter the profession without graduating at a dental college, and also recorded its opposition to the general extraction of teeth. A committee was appointed to suppress dental quackery. Evidently there were some then as now who were merchants and believed they had something to sell, and were not professional men. This is likely unavoidable, as in all times armies and other large bodies of men are cursed with the unworthy element of "camp followers and hangers on."

The coming World's Columbian Dental Congress will beyond a doubt, fix the line of separation between those who lay claim to belong to the profession of dentistry, and who by persistently offering their *wares for sale* by the same methods of advertising adopted by the merchant, demonstrate clearly that they are not professional men, and those who hold to the better standards of all the professions. The latter only will be admitted as members of this congress.

Dr. Taft delivered the public address this year. One other matter occurring at this session is worthy of special mention. Dr. Lucy B. Hobbs was admitted to membership in the society, the first woman to secure this distinction, as she was also the first woman receiving the degree of Doctor of Dental Surgery, which was conferred by the Ohio Dental College in the year 1865.

The society passed a series of resolutions defining their position to be in favor of and encouraging women to adopt the profession of dentistry.

1866. Dr. C. Poor, of Dubuque, gave a clinic with his automatic piston mallet, the first of the kind.

Dental hygiene and nomenclature at this session received marked attention.

Dental legislation was part of the work laid out this year. A committee was appointed to secure it, and this course was continued for fifteen years until the present law was placed on the statute books in 1882.

Dental ethics was very much discussed at length, and the sense of the members was that a dental code ought to be established based upon the great code: "Do unto others as you would they should do unto you."

1867. In this year it was agreed that no student should be received by any practitioner for less than two years in the office, with a pledge of graduation at a dental college to complete the course of training.

A resolution was passed giving a hearty support to the colleges in their efforts to raise the standard of dental education. It appears that then, as now, the colleges were making an effort to reach the highest standard possible.

Application was made to the society to appoint some one to fill a lectureship on dental science in the Keokuk Medical College, which was the first effort to reconcile the relations of dentistry and medicine.

Nomenclature again was one of the topics for discussion and was ably presented by Dr. Judd of St. Louis, he having the same year presented a new classification before the St. Louis Dental Society, which was adopted by that body.

The other subjects of importance were: Special Physiology (illustrated). Etiology of Dental Decay. Sensitive Dentine. Alveolar Abscess, etc.

1868. The subjects presented were: Importance of Preservation of the Dental Pulp (in deciduous teeth) for Dentition. Discussion of the Extraction of the Sixth Year Molar." Views much the same as now held.

There was presented a very interesting line of experiments and tests of saliva. In two hundred and fifty persons the reaction was principally acid. In two hundred and fifty animals the reaction was mostly alkaline.

The usual discussion of what material is best for filling cavities in the teeth. It was not settled however. The first paper on histology before this society was presented, the subject being Characteristics of the Dental Tissues. We were this year committed to the idea that dentistry was a specialty of medicine

At this session was presented for the first time in its history a method of mounting a tooth crown on separate roots with a metal pin, which attracted much attention, but for some reason was never heard of afterward.

1869. Papers read setting forth the progress of dentistry up to that time. Another with Many Incidents of Office Practice, which might have been written for this present meeting. Compressors for bridling the duct of Steno were presented. This duct was the Waterloo of the dentist then. It was before the days of rubber dam. The presentation of so valued an appliance to the profession free and unpatented created such enthusiasm that there was not time enough at the meeting for members to express their appreciation of this generosity. A hearty resolution was passed in regard to it.

1870. The society adopted the Code of Ethics sent out by the American Dental Association. The subjects for discussion were: Vital Phenomena. Physiology of Diseases and Medicine in the Human System. Food for the Teeth (still undecided, I believe). Money was voted to the Barnum Testimonial Fund for his presentation of the rubber dam to the profession. Again, the Chemistry of Saliva received marked attention.

This year in all its awfulness was presented the subject of the Dental Pulp Preparatory to Filling the roots. While this subject is or ought to be well settled, it yet occupies the best part of all society meetings, even now, and is cussed and discussed alternately by all present and usually requires a mandatory motion to pass the subject.

The Evils of Vulcanite came up for its share of attention. From the State University came a voluntary request for the establishment of a chair of dentistry in the medical department of that institution. This made the recognition of dentistry as a specialty of medicine complete so far as Iowa was concerned and was the corner stone of the present dental department.

1871. The subjects presented were: Phlebotomy. Dental Hygiene. Cell Life in Germination. Dental Chemistry. Dental Education. Anæsthetics. Professional Dignity. A New Basis for Artificial Dentures (celluloid).

1872. Theory *vs.* Practice. Diagnosis and Extraction. Treatment of Dental Caries. Treatment of Dental Pulps. Nitrous Oxide as an Anæsthetic. In this year the movement for the establishment of a dental department in the State University was begun, and continued each year until in 1882 the present department was established.

Up to this time we had dropped in with our knitting each

year to meet our Illinois neighbors and they had been doing the same; to gossip, and tell all we knew. At this time it was thought it would be a good thing to hold a joint meeting. A resolution was therefore passed to meet with the Illinois Dental Society in 1873. This was the largest meeting of Dentists ever held in the West, outside of the American Dental Association. These records are full and were published jointly and they are scattered through the Dental Libraries. The good feeling and harmony thus secured has since that time been kept up. Both societies always have full representation from each State at all of their meetings.

1874. Subjects: Causes of derangement in first dentition.

The Legislative Committee reported having secured the recommendation of the passage of a dental law by the Govenor in his message and that a bill had been presented. An amusing incident occurred at the time of the consideration of the passage of this bill in the legislature. The wit of a granger lost the bill. The bill contained the usual clause that nothing in this act should interfere with the physicians extracting teeth. After the clerk had commenced to call the roll on the vote, a granger arose and offered the following amendment: "That nothing in this act shall be construed as preventing a farmer from extracting teeth from his drag or harrow." The point was so good that the body was convulsed with laughter and every man whose name was called after this, answered, No.

1875. Subjects: Chloroform as an Anæsthetic. It was condemned. Alternation the law of Vital Action. Abscess Treatment and immediate root filling.

A movement was inaugurated to appoint delegates to visit medical and other dental societies. This was a most excellent idea and should have been continued, but was not.

1876. Subjects: Fracture of the Inferior Maxillæ. Is the Degree of D. D. S., a badge of only partial culture? Replanting and Transplanting. Electricity in Dentistry, (illustrated by charts and models.) This was the first paper of the kind in the history of the profession. Degeneration of the Human Teeth.

1877. Another step forward was taken in regard to the education of students, viz.: That they should not have office pupilage before they had attended lectures.

Recognition of failures in operations was undoubtedly a thorn in the flesh then as now as the following paper was read: Disinte-

gration, arrestation and prevention of the recurrence of decay on the proximal surfaces of the teeth. Plastic Fillings. Irregularities.

It seemed necessary at this time to call attention to the bad practice of "I warrant all my operations" as a paper on this subject was read.

1878. The method of having a Question Box was established this year which was a scheme creating much enthusiasm and instruction. Clinics seem to have been the main feature this year.

1879. Subjects: Capping or Destroying the Pulps. Which? Still unsettled. Pathology and treatment of teeth after spontaneous death of the pulp.

1880. Subjects: A paper on the good and bad effects of extracting teeth was read and the discussions showed a marked advance in the effort to save the natural teeth. Forces employed in the circulation of the blood. Alveolar Abscess. No particular advancement over the year 1863. Duties to patients. Necessary qualifications for the ideal or model dentist. Lively discussion and a resolve on the part of each individual to reach the goal.

1881. A very enthusiastic meeting was held this year. Though not a joint meeting, the Illinois meeting was in session at Rock Island at the same time the Iowa Society was in session at Davenport.

Subject: Treatment of Exposed Pulp.

Something was amiss with the Dental Colleges at this time individually as a committee was appointed to investigate them and report. I think this was when the Delavan College was at the zenith of its glory. The Question Box and Clinics seem to have been the important part of the session.

1882. This was a year of excitement and enthusiasm as there had been consummated two of the important projects of the past years. The passage of the Dental Law and the establishment of the Dental Department in the University of Iowa.

The profession now felt they were on solid foundations and that they were repaid for their persistent courage and expensive outlay of means and strength.

This year were demonstrated for the first time before any society the methods of bridge work.

1883. Subjects: Effects of Arsenic. Dentists' fraternal relations. Cleft Palate Obturators and Artificial Vela. A new method

of attaching crowns. Anæsthetics, recommendation to discard the use of them in practice.

1884. Subjects: Anæsthesia, (the ghost will not down seemingly.) Mounting porcelain Crowns. Treatment of loose inferior incisors by banding and cementing the bands on. Dental Therapeutics. Bridge Work. Büttner Crown. Heroic treatment of abscess and fistula—Immediate root filling and cavity filled by the Herbst method. Another method of attaching crown to root. As the teeth need saving—Amalgam or Gold—Which? (A new departure.) Reflex Action. Dental Literature.

In all probability much time had been wasted heretofore by the informal manner in which essays had been presented and the rambling methods of discussion so that the following resolution was passed.

That a Committee of Critics be appointed to criticise the papers and modes of discussion.

1885. Extracting teeth. Presenting the principle of uninterrupted pressure in one direction to lessen the pain, and other principles not before brought to the attention of any society.

Law of proportion in Prosthetic Dentistry, relating to the comparative width of the teeth to each other in the same mouth.

Treatment of Alveolar Abscess without Fistula. Pulpless teeth and their final disposition. Health and Physical Endurance.

This paper discussed the importance of sunlight, exercise and the avoidance of awkward positions while operating and especially the tendency to overwork.

Diagnosis and treatment of Pulp Lesions. Duties of Professional Men. Advancement of Dental Science. Root-filling with Chloro Percha, demonstrated by Dr. Bowman, of St. Louis, one of the first appearances of this method.

Preparation of Proximal Cavities. Implanting Teeth. Uses of Cocaine in Dentistry.

1887. Twenty-fifth Anniversary. This was a very largely attended meeting.

The State Board of Examiners reported three hundred and sixty-three dentists as registered in the State in practice.

Qualifications and Subservance of Amalgam in Dental practice.

Discussion showed a marked change in the opinions of members in favoring the use of Amalgam.

Capping Pulps. Cement Fillings. Clinics. Implantation. Contour filling with Bonwill Mallet. Sponge Grafting. Rubber Dam Holders. Porcelain Faced Bicuspids. Peroxide of Hydrogen.

1888. Subjects: How best to promote and develop Dentistry. Tooth Pulp as a Ganglion. Lecture on the teeth from a Zoölogical standpoint. Nitrous Oxide and its demonstrations. Epulis Sarcoma, its pathology and diagnosis. Copper Amalgam. Are the natural teeth saved at the expense of health and life. (Microbic theory and inoculation with instruments was the theme of this paper.) Porcelain settings in the visible portions of the anterior teeth. Amalgam *versus* Soft Gold; not yet settled which is best. Irregularities.

Clinics have always been an important feature of all the sessions of this society. Whenever "anything new under the sun" has appeared it has at once been demonstrated. The unfortunate mistake was made for many years of not keeping a careful record of clinics, and another of not publishing the transactions each year.

This has only been done occasionally and hence important matters are lost to the society or only held in the memory of individual members, and furthermore it is impossible to give credit for the great amount of work done or to discuss the character of it.

Iowa is indebted to the members of the profession of many states for their assistance in making its dental history. Many of the most prominent men have always been ready when called upon to give the benefit of their experience to us. It may be mentioned that Iowa, Illinois, Michigan, Missouri, Kansas, Minnesota, Nebraska, Indiana, Ohio and Wisconsin cannot hold a dental meeting without a good representation from each of the other States in attendance. This lovely bond of union between these states has continued for many years and there is little likelihood it will ever be broken, and what is the history of one will be to a great extent the history of the other.

We are well pleased with the present condition of the practice of dentistry in the State of Iowa. It numbers 150 members in its State Society and nearly as many in the Eastern Iowa Dental Society, which is only a young organization but an outgrowth of the progress of dental science among us.

There are about four hundred and fifty practitioners in the State.

Probably there is no State in the Union where so large a proportion of the practitioners are following the advanced methods of practice. I doubt whether there is a community which as a whole is any better informed as to the possibilities of dentistry. This may seem like saying too much perhaps, but when we consider the small percentage of illiteracy in the State (Iowa being second of all the States in this respect) it cannot create any amount of astonishment, on the part of any one.

The future history will move along on the same line of progress that has characterized the past, without doubt. Of one thing I am certain, there can be no advance for the good of the profession that will not meet with a ringing response from Iowa.

GUARDIANSHIP OF THE TEETH—PARENTAL, PERSONAL, PROFESSIONAL.

By Grafton Munroe, A. M., D. D. S., Springfield, Ill.

The position of guardian of a trust of any sort whatsoever is a position too often filled by those who have no genuine appreciation of the object, animate or inanimate, submitted to his or her care. The dentist in his position of guardian of the teeth has a duty of a serious character to perform in protecting his patient's teeth against the ravages of decay; and that dentist, who will sacrifice the natural organs because such work is easy compared with the labor and tedium of nerve devitalization and extirpation, and consequent restoration of the natural organ without entire artificial substitute is not fit to fill the position of guardian of the teeth.

Realizing then, the importance of the position of one, who is by choice a guardian of the organs of mastication, I have thought it proper to speak of the subject under three heads. First—*Parental.* Having recently reached the exalted position of parent, the writer feels himself, in a measure, at least, capable of speaking on this phase of the subject. Here a suggestion—let every dentist become a parent.

In a practice of a little over eight years it has been a frequent surprise to find parents with no knowledge of even the number of teeth constituting the temporary set; so great has been this want of knowledge that parents sometimes actually set their ignorance against the knowledge of a practitioner of dentistry in determining the care of the six year molar, affirming that the tooth in question is to be shed and consequently must belong to the first set.

How can we as professional guardians overcome this want of knowledge on the part of the *parental guardians* of the teeth. Physiology is a branch which, in a general way is or should be taught in all schools. The functions and the anatomy of the teeth receive their portion of this general study and the knowledge is soon forgotten. Most parents have had

some acquaintance with a dentist, and it is a duty the parent owes the offspring to obtain some knowledge of the teeth. Placed at the very entrance of the alimentary canal, the teeth certainly occupy a position of prominence in the economy of the human organism and so much so that their importance should not be neglected in our thoughts, and in our acquaintance with our dentist we should use the opportunity to familiarize ourselves with the needs and care of the children's teeth. Could parents but bear this in mind, it can be safely affirmed that they would find their dentist a most willing imparter of the knowledge necessary to a proper understanding of the care of children's teeth.

Let parents awaken to the proper appreciation of the natural organs and then they can better preach to the children. The use of the brush in the presence of the little ones, before their teeth are all in place, encourages their curiosity and they must soon know what it is for and why they can't have one too.

The proper attention to the diet and eating of the little ones given to our charge cannot be too forcibly impressed upon parents. The gratification of the appetite for sweets and food not easily assimilated is too often practiced by those having the care of children, to such an extent as to cause serious impairment of these important organs.

Did parents bestow as little care upon the hair and nails, although less firm but kindred in their origin, as is given the teeth we would have a race as homely in appearance as are many of the mouths that come into our care.

Many parents are so thoughtless of the needs of attention to the children's teeth that their neglect becomes apparent to them at such a time only as when the child is suffering with an aching tooth. Then they are surprised that the child's teeth should decay so rapidly, when the parents themselves have neglected the first principles of watchfulness and proper tuition of the child to cleanliness of these organs.

Parents should avoid all rehearsals in the presence of their children of what they term the horrors of dental operations. Children would then not come to us professional guardians with the idea each time we made a turn of our hand to procure some necessary aid to the examination of the teeth or aid to the proper performance of a dental operation, that we were about to inflict a torture similar to the times of the Spanish inquisition. While I do

not believe in working by deceiving their confidence, I do think that better results would be accomplished by the more judicious use of the tongue on the part of parents concerning the pains occasioned by a visit to the dentist.

An unfortunately large portion of the responsibility for the character of the teeth falls upon the maternal side; at the same time it cannot be denied that the paternal side exercises a large portion in the line of heredity. The influences are so marked along this line that it is almost safe to say that "like begets like," though exceptions often prove the rule. If by some means there could be devised a way of escape from the baneful results of the inheritance of poor teeth, our branch of medicine would be called forever blessèd. Try as we may the law of heredity stands as a constant menace.

The formation of the teeth commencing so early as the forty-fifth day of pregnancy warrants the assertion that mothers have a charge to keep, and keep well they must, or the results of their poor guardianship will be painfully manifest.

Mothers have a charge in caring for their health during the period of gestation so that all the organs and the health of the life within them may be of the highest type. The law of the survival of the fittest ought to stir both mothers and fathers to the desire to impart to their offspring organs of perfect mechanism.

The changes in nutrition and the unfortunate nervous disorders which so often accompany the period of pregnancy all have their influence upon the formation of the teeth. The use of proper bone-making foods might be a good regimé for many mothers, and attention to proper exercise and hygiene would no doubt have a happy result in the production of healthier organs, even down to the teeth.

Second—*Personal*, includes under this head the dentist himself, who is naturally looked to as the criterion of practice, so that it may be said of us that "we practice what we preach." Nothing speaks louder to me in terms commendatory of our habits of life than the exhibition of a clean mouth. The beauty of a fine face and a face expressive of character is often marred by unkept teeth. Sickness and certain conditions of the oral secretions no doubt offer considerable impediment to cleanliness of the mouth, but in many cases the mouth is like many sepulchres—clean without, but within they are the places of almost the equivalent of

dead men's bones and rottenness. I have often tried to impress upon my patients—when operating in a putrescent pulp canal—the importance of frequent visits for the care of the dentist, so that such awful surprises, calling forth expressions—"Is that in my mouth?" or "I didn't know that such a thing could take place in the mouth" —would not occur, and in many cases the olfactories of both patient and dentist would be spared. As in the case of parents in the presence of their children, so we as friend to friend, should be careful how we use that unruly member, the tongue.

Often have I had patients come under my care, who though never having been under a dentist's care were so well acquainted by proxy, with all the operations necessary in the care of the teeth that they fairly trembled before the work began. Upon inquiry into the cause of this fear, it was found to be wholly based upon information received from a friend.

Few people in their personal attention to their mouths and teeth can be accused of too scrupulous care. The brush should never be used less than twice a day, and the well-directed use of a wash of an antiseptic nature would often prove a most wholesome practice. As the mouth does not afford easy access for personal observation it becomes a duty to make at least an annual call at the dentist's office, and let us hope that the day is not far distant when it shall become as much of a personal obligation to look after the condition of the mouth and teeth as it has become so in regard to complying with a sanitary measure requiring the vaccination of a child before it can enter a public school.

The use of sweetmeats at promiscuous times without any cleansing of the mouth or teeth thereafter, gives the mouth a condition favorable to the progress of caries. This is exemplified by the condition known to exist in the mouths of those subjected only to the fumes of sweets.

Females are blessed with teeth of unfortunately feebler constitution than males, though their lives are subject to influences which would make stronger teeth yield. Before passing from this division of my subject I must give a few moments to the guardianship of the teeth during that important period through which only mothers pass. For so long a time has pregnancy been regarded as having a baneful effect upon the teeth and so commonly does the notion prevail that it is a trite saying—"for every child a tooth." Because of the close relations which the teeth bear in sympathy

with, if not in direct connection with the other parts of the body, it is very important that the owners of these necessary organs of mastication should guard well their charge. Subjected to the so many varied changes in the general system which characterize the pregnant state, it is not a wonder that with the little care they get, the teeth are a frequent source of annoyance. The worry and general nervous condition of mothers attendant upon pregnancy are often increased by poorly cared for teeth. Too much stress cannot be laid upon the importance of attention to the teeth very early after parturition, for the changed condition of the salivary and buccal secretions, together with the ever present lactic acid fermentation, will produce sad havoc, if measures are not taken to counteract them.

That part of my subject which comes nearer to our own domain is professional guardianship. Men who are students by choice and who have been educated along certain lines and who give up the best part of their time to the acquisition of experience and skill are deserving the title of professionals. Being thus specially educated for the care of the teeth, it becomes us to be studiously watchful of these organs in the mouths of those who place themselves in our care, endeavoring by a conscientious discharge of duty to inspire thorough confidence on the part of the patient. Impress upon patients the necessity for a regular examination of the teeth and always endeavor to be accurate even though the statement of facts may excite surprise. Never be reluctant to show a patient with a glass the condition of the teeth. Many a conscientious dentist has no doubt frightened a patient out of his guardianship by the assertion that there were many cavities in the teeth, whereas had he pointed out each cavity—the patient viewing them in a mirror (if so desired),—would have better understood the existing conditions. Avoid as far as possible hurried work and let the patients know that you seek thoroughness and that a slighted piece of work is apt to prove of less durability. As a professional guardian the dentist should be a man of clean hands and clean heart; in fact he should be preëminently a clean man Many of the subjects of our care, in the mouths of our patients are often not great incentives to cleanliness, but it should be our duty to raise them to a higher level and let our personal condition be the criterion of cleanness. Moral cleanness should also be urged, for as men ourselves we would wish to intrust our own families in the

care of only such men as we knew were clean. Strict attention to business is as cardinal a point as any of those already mentioned. The dentist who is not readily found and is such an one as has to be sought out in some gaming place or on some street corner had better relinquish his title of guardian of the teeth and not lower the standard to which he ought to have aimed. Agassiz, in his will, wrote himself *Louis Agassiz, Teacher.* In our daily toils we should make ourselves conspicuously willing to teach. I have often had patients say, "excuse me doctor, if I ask you many questions, but I would like to know" this or that. It is our privilege, and should be considered our duty, to spend much time in learning for all and after such is acquired by study, to be glad to teach all. Would it not be a good idea for dentists without being obtrusively conspicuous or over persistent in seeking public attention to endeavor to have—say one hour a month given in our public schools to a talk by a dentist of the community—having it so arranged that it would not be the same man each time?

Endeavor to have your workings and doings free from the mysterious. Teach in all the ways you can without parading your knowledge and above all things do not boast your learning above others. Would that we as dentists were all circumstanced and so disposed with the necessary learning and zeal, after the manner of Agassiz—to employ our energy so that the almighty dollar would not be so preëminently the theme of our song and that the possibilities of scientific dental work would not be based on the hope of remuneration. As guardian of the teeth each dentist bears a relation to his fellow practitioner and to his brother in the general practice of medicine. Happy that day when the general practitioner of medicine awakens to the importance of giving due consideration to the organs which engage the care of the dental practitioner. If the causes of many of the troubles to which flesh is heir were looked for in the teeth and relief of some dental lesion sought, by reference to a practitioner of dentistry, much unnecessary dosing would be saved and the science of medicine in all its branches would be a greater help to mankind. Let dentists seek to avoid the promptings of jealousy and be ready to give to his fellows credit for accomplishing something. In other words: "Give the devil his due"—even tho' he be a pretty poor devil.

The limitations which the laws of ethics place about a professional guardian, should be well adhered to and at the same time

justly used. The rights claimed to patent any new method or new article should be as far above us as it seems removed from the general practitioner of medicine, and yet when looked at from the standpoint of necessity for personal maintenance, it appears in another light. We hope for good results along this line in the efforts that are being made under the name of the Dental Protective Association, but whatever we may discover or invent, the day will not come in our time when there will not be ravages of past disease to repair and conditions of present disorder to cure. In the words of another "What can we who must do our daily tasks do toward broadening the horizon of dentistry, toward hastening the happy day when dental disorders shall be rather prevented than cured? It is not too violent an exercise of the imagination to fancy the dental practitioner of the future receiving a new patient; the chair, the mouth mirror, the probes will all be there and the examination tooth by tooth as minute as now. There will follow a series of questions covering the ancestry, the habitual surroundings, the personal history and habits of the patient, and at last the dentist will give his judgment."

There are two other points upon which I wish to touch and I will have done. The dentist's fee should be one that will compensate him for the guardianship he endeavors to exert over these most important organs but amid his desires for proper compensation, it might be well to have a little charity for those who are his victims.

The dentists' health is another requisite, which will be the better promoted by attention to proper light, proper exercise and proper hygiene in general, for with a good nerve, a good stomach and a steady hand he can handle all, from the most peevish, fretful and spoilt child to the acutely sensitive or even pregnant woman and the nervously timid man.

Let us strive to have a sound mind in a sound body and give to our proteges the attention due them at the hands of Professional Guardians.

DISCUSSION.

Dr. T. L. Gilmer: The paper has so fully covered the ground that there is very little left for me to add. I think it is well for the dentist to occasionally turn aside from topics more commonly discussed, and give his attention to subjects of the finer kind.

We talk about bridges and crowns and all manner of operations too much to the exclusion of some of the nicer subjects. I think we all agree that the paper is excellent and timely. The paper spoke of lack of knowledge on part of the patients. I presume that there never will be a time when our patients will not need to be educated in regard to the care of their teeth. I believe, that if we do our duty, we save more teeth by teaching our patients how to care for their teeth than by filling them. I have known young girls whose teeth were seemingly melting away when they were placed in my care, largely from neglect. They were willing, when taught, to take proper care of their teeth; and the devastation which seemed in a fair way to soon deprive the patient of these organs was almost immediately arrested by thorough cleanliness. No filling can save such teeth without vigilant care exercised by the patient.

There is one thing that I have found even in the mouths of my patients who honestly endeavor to take the best care of their teeth; that is, there will be certain parts of the mouth which will be neglected, while every other part will be thoroughly kept in order. These neglected spots should be pointed out to our patients. I was glad the doctor spoke of the baneful influence of frightening children regarding the seriousness of dental operation. Children should not be given exaggerated ideas of the painfulness of dental operations. As a rule, if we are gentle and truthful, and children have not been previously frightened, we can perform very creditable operations for them.

The essayist spoke of heredity as a cause of poor teeth. Of course, there is no doubt children inherit a tendency to disease, but we know that environment has very much to do with offsetting predeterminations, and when we know of a tendency to decay by inheritance, we should be more alert, and use every means to offset the tendency.

What to do to prevent the rapid destruction of teeth during and immediately following pregnancy has been a question that has given me cause for much thought. When I have had girls under my care from childhood until they became women, I dreaded to see the condition their teeth will be in when they are married and become mothers, as the probabilities for rapid decay of teeth are so great during the period of gestation. Bone making food does not succeed always as it appears to have done in some cases

that have been reported to us at this meeting. I have sometimes thought I have benefited my patients by a certain diet; at other times I have felt discouraged because with the same treatment there seemed to be no benefit whatever. I feel doubtful whether it is so much a lack of the lime salts in the system as it is a lack of the power of the person to assimilate and appropriate the lime that is necessary for this purpose, and I doubt very much whether during pregnancy or any other time we can direct the lime to the particular spot we desire it; besides, it is very uncertain whether nutrition can go to enamel after it is fully formed. I have lived in communities where all the water drank was thoroughly charged with lime, and the food used was of the kind that produces bone; and yet I have seen no particular difference in the character of the teeth of persons living in those localities and those living in localities where there was little or no lime in the water, and less phosphates used in the food. We know that through the excretions there are large quantities of lime thrown off, and there may be deposits of lime on the teeth in the same mouth, but nevertheless, the patient's teeth are rapidly decaying. If we know how to select food or medicine for children which will aid them in the assimilation of lime and the deposit of it in selected spots we have made a great discovery. The essayist believes that females have poorer teeth than males. I am doubtful whether females have poorer teeth before they bear children than males. In regard to dentists visiting the public schools to educate the children regarding the care of their teeth, I think it better to instruct the teacher and let the teachers instruct the children, as they can better adapt themselves to the children, and it requires less time and less publicity.

Dr. G. Newkirk: We have been represented this afternoon as guardians. What is involved in the idea of guardianship? Have we in our practice as dentists fully realized its importance? The guardian of small children assumes a very important responsibility. The whole future welfare of the child is bound up in his trust. So far as our guardianship goes as dentists, we ought to feel this responsibility in a corresponding degree. That means that we take a personal interest in each one of our patients, and particularly, a kindly, tender, personal interest in the children who are placed in our care. I feel sometimes as though I were an uncle to every one of them. I am glad to see them when they come in, and I want them to feel that I am one of their best friends.

Do we lay stress enough on the idea that we are the educators of those of the community with whom we come in contact so far as dentistry goes? The ordinary person cannot get a very comprehensive idea of professional matters, because he has his own affairs to attend to. How do we get our impressions of what medicine is, of what the physician should be? Only from our acquaintance with certain physicians. I remember how my impression of medicine and medical practice developed. My first idea was associated with an old physician who was considered the least dangerous of any in our community, and so employed by our family. It was a crude conception of the profession of medicine that I got from him, but since then as I have from time to time become acquainted with other men, I have obtained broader ideas of what the profession of medicine really means. We are the teachers of the community, so far as dentistry is concerned.

In the paper reference was made to teaching in public schools. That is an old idea, and at first glance it seems an excellent one, but it is usually quite impracticable, for this reason: Immediately a dentist, where there are several other dentists, goes into our public schools and talks on dental matters (and he may be the only man in the community capable of doing it), it will be considered by his professional brethren a means of advertising, and creates jealousy. If a dentist in one town could go to another a hundred miles away among strangers, and deliver a course of lectures, and the dentist in that town go to the home of the first, "exchange pulpits" as it were, possibly the difficulty might be avoided and teaching in the public schools be made practicable.

Dr. H. H. Townsend: I wish to refer briefly to what Dr. Gilmer has said about digestion and assimilation. I have studied the question of care of the teeth during pregnancy a great deal. These patients may take the proper amount of food or lime salts, but there is a great lack of assimilation. The bad condition of the teeth which occurs more frequently during pregnancy than at any other time is sometimes due to a withdrawal of the lime salts, and then again to a lack of assimilation and the improper use of foods.

Dr. Black: I wish to say a few words on a single point. I am sorry I was out of the room and missed a part of the paper, but what I have heard in the way of discussion it seems to me a word should be said upon the point that has been spoken of by the last two speakers.

Seventy-five years ago caries was generally regarded as a disease beginning within the tooth and working its way to the surface, caused by inflammation of the dentine or some disturbance that brought on inflammation of the dentine. For this you may refer to Hunter, Fox, Bell and others of the older writers, particularly before 1835. We have learned since—and it took us nearly seventy-five years to do it—that caries always begins upon the outside, the cause acting from without in every case, and is not dependent upon any disease beginning within the tooth itself—a corrosive or harmful agent acting upon the surface at the beginning and from the surface proceeding toward the center.

The discussion in regard to the feeding of patients with lime is of the same old order precisely. I regard it as an outcrop of the older notion that caries was caused by some disease within the tooth itself, not by an agent acting from without upon the tooth, which we have not as yet entirely cleared up. If we can get clear of this idea in its entirety, that decay is caused by something within the tooth, I think we will also be clear of the idea that we may prevent caries by feeding the teeth lime salts, and then we will turn our attention to the secretions in which the teeth are bathed to find the influences which determine in this case or that the cause of the greater decay at this time and at some other time. We will then seek for foods that shall hold these secretions in the best condition, for foods that will sustain the nutrition of all parts of the body, for foods that will furnish secretions of the best character in which these teeth shall be bathed. It is in this direction that we must turn our attention in regard to the feeding of patients to prevent caries of the teeth, and not to the feeding of lime salts to build up teeth. In some conditions we may feed lime salts to build up the bones, because we know they are being torn down and reproduced. We have no evidence in the histological construction of a tooth that they can be torn down and reconstructed. This evidence is continually prominent in the bones, but it is absolutely lacking in the tooth. With the knowledge we have obtained that decay always begins on the surface from external agents, we should in our feeding look to fluids that bathe the teeth, and not to the feeding of the teeth themselves.

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

Your committee on Dental Science and Literature offers the following as the report for the year ending May 9th, 1893. As has been the custom, the labors of the Committee have been divided, and the work of each member has been grouped separately, Dr. Harlan reporting on Dental Literature as follows:

Report on Literature.

The year just closing, since the last report on Literature, has been devoted mainly in many quarters to a preparation for the event of the year—the convening of the World's Columbian Dental Congress. Whether this has had anything to do with the production of books, or the establishment of a weekly dental newspaper *The Dental Tribune*, I do not know. Rehfuss' Dental Jurisprudence is probably the most notable book of the year in the United States on a subject which all should be interested in.

Ottolengui's book on Filling Teeth with gold is recommended as detailing one man's practice. Whether this is the best way to handle a subject, I do not pretend to know. The book is very readable, and the illustrations are good. D. W. Buxton has a book on Anæsthetics, and A. S. Underwood another; both are practical. H. C. Quinby has a new edition of his Dental Practice out and Hunter a manual for the Dental Laboratory. The latter is very readable and full of good points, as is Evans' new edition of Crown and Bridge Work and Black's Dental Anatomy, second edition. Students are given three distinct books by the indefatigable Gorgas, and they get one from J. T. Rymer, and one on Materia Medica from E. L. Clifford. As these are all intended for students in college they will scarcely interest you. Hints and Compends are two in number, one by W. H. Steele, 567 hints for the busy dentist, and Catching's Compendium which is an annual visitor of great value to all dentists who can read English. J. S. Cassidy furnishes the best book of the year on Chemistry and Ma-

teria Medica, primarily adapted for students, but of much value to practitioners also.

For the curious reader, a work entitled the "Rise, Fall and Revival of Dental Prosthesis," is offered by B. J. Cigrand of Chicago.

A second edition of Guilford's Orthodontia is just out. This is said to be a great improvement over the first edition, as is Angle's Orthodontia second edition, also out during the year.

Warren's Quiz Compend on Dental Pathology and Dental Medicine is intended for students at school or in an office. The really valuable books on materia medica for the year are Helbing's and Cerna's, and Martindale and Westcott's pocket pharmacopœia.

It is believed that the duties of this committee in reporting on the progress of literature as applied to dentistry is as nearly complete as it is possible to make it. We cannot tell with the knowledge at our command what is best to be read by the members of this society. The individual opinion of the writer of these lines is that the subjects which appeal most strongly to the taste and inclination of a dentist are the ones he should study.

In Bacteriology the volumes of Sternberg and Miller should interest the scientific dentist, and in Chemistry Morley and Muir, and Watt's Dictionary will well repay the time devoted to it. The other subjects already spoken of as offering a range to select from, will, we feel sure, give to all the coveted opportunity.

We think that the scientific quarterly should be forthcoming in the near future. Who will undertake it? Surely there must be some line in art, science or practice that has a special attraction for our members, and we appeal for a wider course of reading in general literature than has previously been undertaken by dentists so that they cannot be reproached with not being literary in their tastes. An acquaintance with the classics in English is more than a liberal education for many, and a recreation for the whole of you. Who will undertake a systematic drill in this channel of enlightenment?

Dr. Noyes makes the following report on materia medica, therapeutics, bacteriology, microscopy, dental education and legislation and on miscellaneous subjects, and recommends the articles given below, to those seeking information on these subjects. The list is copied from the bibliography published in the *Dental Cosmos*, and

includes only articles published in the English language. Of course it is not complete, but is believed to include most of the papers of much importance on the subjects named.

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R. D. Pedley, "The teeth of pauper children."—*Brit. Jour. Dent. Sci.*, 1893, p. 103.

G. W. Sichel, "Dental jurisprudence, with a few suggestions for the practitioners of dentistry."—*Dental Review*, 1893, p. 127.

C. H. Sippel, "Condition of dentistry."—*Dental Review*, 1893, p. 105.

Carrie M. Stewart, "The saliva from a dental standpoint."—*Dent. Register*, 1893, p. 79.

E. D. Swain, "The young dentist's sphere of usefulness."—*Review*, 1893, p. 111.

The remaining portion of the report is offered by the Chairman, and its meagerness is partly due to the lack of real advancement in the lines covered, and partly from the inability of the writer to study critically all articles appearing under the titles embraced in surgery, pathology, histology, chemistry, electricity etc. Indeed, it is impracticable for the busy man to read and properly digest and weigh all the subject matter embraced under these heads, and give a just estimate of their value.

The Chairman, in retiring from the committee, is still of the opinion expressed last year, that much time is wasted by the members of the committee in making these reports which might

be more profitably employed in the interest of the society if directed in other channels. The writer doubts very much if the members of the society consult to any very great extent the report for the purpose of increasing their information. Now that we have such an excellent annual as Catching's Compendium, publishing most of the better articles appearing in the dental periodicals during the year, and the bibliography in the *Cosmos*, which includes the title of every article published bearing on dentistry, with the name of its author, and the name of the Journal in which it may be found, it would seem that the committee might profitably be abandoned. In surgery, the only article which seems to the writer so far as he has been able to read, worthy a place in this report, and he has some misgivings in this, is the Cryer operation for exsection of the inferior dental nerve. The description of this operation may be found in the proceedings of the American Dental Association for 1892.

In surgery there is seemingly a tendency toward the abandonment, to so great a degree at least, of the use of bichloride of mercury as an antiseptic, and a greater use of heat sterilized water and the essential oils and other antiseptics less poisonous and less injurious to instruments than corrosive sublimate.

If there has been any special advance in dental pathology the writer has not found it. Commencing in the January number of the *Cosmos*, 1892, there is an interesting article to which your attention is directed entitled "Adenoid Growths, Mouth Breathing, etc., etc., relating to Deformities of the Jaws and Irregularities of the Teeth," by Dr. Norman W. Kingsley.

To those interested in histology in its relation to dentistry there will be found an interesting article in the *Ohio Dental Journal*, June number, 1892, by Dr. H. Fletcher, entitled, "The Skin and its Appendages, with Special Reference to the Teeth."

There is another article in the January *Review*, 1892, by G. H. McCausey, entitled "The Enamel, Dentine and 'Nerve,'" to which your attention is called. During the year several articles relating to Dental Histology have appeared in the *Journal of the British Dental Association*; each will be found interesting.

In chemistry no new elements have been announced, and there is nothing to note other than the change in nomenclature. The changes agreed upon were made last August, at Rochester, N. Y., by the American Association for the Advancement of Science. A

concise statement of some of the changes made may be found in an editorial in the *Cosmos* for December, 1892, to which your attention is called.

THOS. L. GILMER, Chairman.
A. W. HARLAN,
E. NOYES.

DISCUSSION.

Dr. W. A. STEVENS, Chicago: I cannot see that there is anything in *Catching's Compendium* that it should deserve so high a recommendation in the report of the committee. My reasons are (1) that 95 per cent of the articles contained in it are valueless. As a matter of necessity, the author is compelled to leave out a great many of the articles that are valuable and would be to the book if published therein, but those articles are copyrighted. I take nearly all the leading dental journals, and by the time I read them I have obtained much more information than can be found in *Catching's Compendium*. I do not like the manner in which the *Compendium* is published. You are buying a "pig in the yoke," so to speak. You do not know what you are paying for until you get the book. It contains the opinion and judgment of one man. I believe that a great many of the books that are published in this manner never come up to the standard of the prospectus. They are essentially different.

Dr. C. N. JOHNSON: Dr. Noyes has said that the *Compendium* is made up of articles taken from our dental journals, and that if the *Compendium* is weak it is because the journals are weak. I want to carry the responsibility one step further. If the dental journals are weak, it is the fault of the profession. If the profession will not write for the dental journals they cannot publish creditable articles.

HANS BLOCK, Chicago: I wish to make a few remarks in regard to Dr. Ottolengui's book, which has been referred to by the committee. I have stated in my article, which appears in *The Dental Cosmos*, that the book is invaluable. For the same periodical, however, Dr. Ottolengui's remarks in regard to plastic fillings are severely criticised, and very properly; but the merit of the book lies in his method of making cohesive gold fillings, because it contains the fundamental laws of making such fillings. His instructions with regard to the internal arrangement of cavities are

the best I have ever seen. But strange to say, the gentleman who criticised Dr. Ottolengui's book said he had the ability to give better instructions than Dr. Flagg had given on plastic fillings. Dr. Flagg is no doubt the highest authority on plastics, that, however, is no reason to blame Dr. Ottolengui because he "placed himself beyond highest authority." What does highest authority mean? I take it, that highest authority is any person whose work is highly esteemed on account of its merits, and the experience and ability of the man. It does not mean that another person is to be prevented from pushing his inquiries further, or to be original in his researches, as authorities are not saints.

With regard to the opportunity of giving dentists a review of dental literature, I will say that I do not think a compendium or any one monthly journal is the best medium for doing this. It would be better if the list of original communications appearing in the leading dental periodicals were published in a weekly dental journal, such as *The Dental Tribune*, edited by Dr. Ottofy, then dentists could select such articles from time to time as they desired for their edification.

The committee in its report mentioned that surgeons were doing away with bichloride of mercury. It should be hoped that surgeons will do away with more than bichloride of mercury. In the medical colleges there is by far too much fondness for curing diseases by means of surgical operations, although they can be cured much better, less painfully, and with less danger to the patient by other methods. It is strange to listen to the lectures of professors of surgery, who are perhaps unacquainted with other methods, and hear them say that such and such diseases can only be cured by the application of the knife. It is a great mistake. Surgery is losing friends daily. While in Europe, I saw students going to sanitariums where diseases were treated other than by surgical measures. I allude to the method of cure by water. Water can cure by far more people than perhaps any member in this hall would expect. Water is able to create a centrifugal power and aids in the elimination from the body of effete material. No surgeon can ever make such an opening as is made by nature when supported by water. In this way, I often think that though such small operations as are done by dentists on structures of low vitality are indispensable yet the therapy of all oral diseases of inflammatory character may be materially aided by water treatment. For

instance, if we wish to get rid of effete material in a root canal, it would be a good method to introduce something, such as linen fibers soaked with water, which creates a centrifugal power and helps to remove it. It would then be cleaned. A root canal cannot become clean by introducing drugs and leaving behind effete material. Sterilization is not so perfect in the removal of such material as the centrifugal power created by the proper application of water.

Dr. STEELE, Forest City, Iowa: I do not think that many of our professional brethren realize how much work it is to furnish the profession such a work as Dr. *Catching's Compendium*, and have the work contain only such matter as will be useful to, and equally acceptible to every individual reader.

The old adage "that what is one man's meat is another's poison," is very applicable here. I have had a little experience in this line myself, and while I have received but few criticisms on my book, those I have received are very valuable, as they will be guideposts along the line of future work in this field. With all due deference for what has been said by the worthy gentleman who has just spoken, we should bear with the faults and points mentioned, as I assure you, one who has not carried through a work of this kind can have but a faint idea about the amount of work required to gather up the material and boil it down in order to put it in readable shape, for a book of this kind.

Dr. A. W. HARLAN, Chicago: The object of a compendium, such as Catching's, is to select such matter as will be appreciated by members of the profession who do not take all the journals, and who may not be able to take them. The criticism of a compendium as a repository or bibliography is not just, because a compendium does not pretend to be a bibliography. The work that Dr. Catching has done is patterned after the work of Sajous' Annual of the Universal Medical Sciences. It comes out every year in several volumes, while *Catching's Compendium* is compressed into a single volume. He publishes what he considers to be the most salient and necessary things for busy dentists who do not read very much, and in that sense I think he accomplishes what he sets out to do.

With reference to Ottolengui's book, the few lines that were said about it were neither derogatory to it nor particularly commendatory, because it was stated that it was the experience of a

single man following a single line of practice. It is not a work on operative dentistry. No flight of the imagination could cause any one to call it a work on operative dentistry. It has the details of a single method of practice, and while there are many good things in it and it is well illustrated, and it is intended to be read by those whose primary knowledge has already been acquired. It is not a book for teaching; it is a book for a man to read and weigh and who can discriminate between the good from the bad.

With reference to the use of water, I understand perfectly well that water has a great future before it, and its use in medicine is growing. There was a senseless antipathy to water brought up a good many years ago in medicine, because those who made use of it were not educated physicians, scientists, or savants; but to-day in Germany, France, and in the United States a more intelligent appreciation of the properties of water as a remedial agent is beginning to be felt, and the book of Baruch on "The Modern Uses of Water" is one of the best in the English language. I recommend any one here, who wishes to know something about water, to purchase that book. It costs a dollar. It is true that water, when sterilized, has a place in dental surgery. Just what particular form of water should be used is a question yet to be determined. It is much better to get rid of effete matters with water, perhaps, than it is to burn them up, but many times you cannot get rid of them and you cannot burn them. What are you going to do? You must sterilize them, desiccate them, and then displace them.

A word with reference to the general report of the Committee and I have done. I thought two years ago that the Committee should be abolished, and I think now that there is great room for improvement in the report of the Committee. I have been on the Committee for two years, and I know how difficult it is to select the kind of pabulum that ought to be presented to an audience like this. It would be better to have a Committee of one and make that one responsible for the whole report. The Committee has followed the plan of dividing the work in the last two years and giving each member individual credit for what he did. That hampers the members of the Committee. They are apt to intertwine, overlap and conflict, and for fear of doing that they do not lay out the full range of their possibilities, so they do not epitomize, condense and present that which should be given.

REPORT OF COMMITTEE ON DENTAL ART AND INVENTION.

The past year has probably been as fruitful in the production of new appliances as any year previous. The profession has seen so many rapid strides in advancement in so many directions, that we do not stop in wonder and amazement, perhaps, as in the past; particularly is this so in "Dental Art and Invention."

We think the profession is not aware of the great number of little things that are being introduced almost daily, and it is the "little things" or little helps that aid us so much in our daily practice to gain the degree of success we should all strive for. In new materials for filling there has not been much of anything offered that is new. Dr. Ames offers a new cement, "Ames' Crystalline Cement," which he claims is equal to the best before the profession. The committee think it worthy a trial, and recommend all to try it.

It might not be amiss to touch upon some of the filling materials of the past. Copper amalgam has, as a rule, proven a thing of woe; the uncertainty attending its use, as to whether it will remain and attend to its duty or gradually steal away, has led to its abandonment by a large number of the profession.

A new cement, Harvard cement—one of the French preparations—not knowing anything of its merits the committee cannot offer any recommendation.

Aluminum foil for filling was reported at last meeting. Those who had used it at that time say that it does well, and that it can be used in place of amalgam in many cases, but for some reason it has come into use but little. Aluminum amalgam is highly spoken of, and it is said to stand the test of time very well.

Quite a number of new appliances have been presented. Dr. Antes, of Geneseo, Ill., has invented a blowpipe by which he uses gasolene vapor and secures a steady blast, both a large flame and a small needle like flame. The doctor will show this at the clinic.

Dr. E. Ebi, of Cedar Rapids, has invented a centrifugal engine mallet. It consists of a revolving head, containing two blocks or tappets pivoted at the circumference. By revolving the head these tappets strike the head of the plugger point holder. It makes two taps on the plugger point every revolution. The force of the impact is governed in two ways, one by the speed of the motor, the other by light or heavy pressure on the filling. It is easily handled. The blows are readily adapted for malleting on the edges of cavities. These taps are of a softer nature than those hard ones that make malleting so unpleasant to the patient.

L. J. Mason & Co. have introduced the best sandpaper disc mandrel yet given the profession., Also have invented a speed regulator and reversing attachment for suspension engines. Can be run with either water or electric motor.

Dr. Hollingsworth has invented a set of dies for crown and bridge work which is the best and most complete thing for that purpose yet offered the profession.

There is now in use a method of making porcelain face crowns without soldering the porcelain to the backing. The writer has used the method with great satisfaction and good results, and would advise all to give the method a trial. We are unable to say who is the inventor of the method.

The Detroit Dental Manufacturing Company have placed on the market a small furnace for making porcelain crowns and inlays. It seems to be just the thing for that kind of work; also a rubber dam holder, which is very good.

The S. S. White Dental Manufacturing Company have improved their die plate by doubling the number of dies and reducing the price.

Grooved plug pliers by Dr. Alex. Jameson.

Chamois cushion and gold tray, neat articles in their way. Hot air and nitrous oxide syringe, the air being heated by passing through a bulb containing carbon, which being heated retains its heat for a long time. For nitrous oxide it is attached to the cylinder and thereby can get the cold effect of the gas as it comes from the cylinder.

Gutta-percha cap crowns for temporary use, for protecting the tooth or root while a crown is being made.

Peesos—Root reamers, for reaming the roots to receive the pin of a crown, a very good and common sense instrument.

Mellotte's moistening pads, made of muslin and cotton, for keeping corundum points and stones wet while grinding in the mouth. They are so cheap that when one has been used it can be thrown away, thereby insuring cleanliness. A holder is made to go with the pads.

Mellotte's revolving brush block.

Ash & Sons send a pair of Young's adjustable perforators for quickly and accurately punching holes in a backing to receive the pins of a porcelain tooth. A very good instrument.

A rubber abscess syringe with platinum point, which we would recommend. Mouth prop which is adjustable.

Dr. Chas. E. Blake, San Francisco, has a large collection of forceps of special forms, of which he is the inventor. The instruments show great inventive skill and genius on the part of Dr. Blake, and any interested in this direction will gain profit by examining these forceps.

Dr. Sitherwood shows a blank book and hand stamp by which every dentist can make his own journal and register operations. It is more simple than the ordinary register; can be stamped by the office assistant. Every operation during one year is kept in one book.

E. H. Allen, Chairman.
W. B. Ames,
J. Frank Mariner.

REPORT OF THE SUPERVISORS OF CLINICS.

The Committee on Clinics offers the following report:—

Thursday, May 11th.

Dr. F. R. Ross, Chicago, *operator*. Dr. H. Alfred Gunther, Chicago, *patient*.—Pulp removed from right superior second bicuspid. After thorough cleansing and use of oil of cassia the root was filled with chloro-percha.

Dr. E. M. Robbins, Carthage, *operator*. Hans Block, Dresden, Germany, *patient*.—The left superior second molar. Occlusal surface was filled with aluminum foil. The foil was crimped and cut to suit the case. Placed upon a sheet of mica and heated, and worked like cohesive gold. The cavity was not one to test the working qualities of the material. The advantages of this foil are not apparent to your Committee. The edges seem to be lacking in necessary strength and stability for large compound cavities and it appears to be as difficult to manipulate as other foils.

Dr. A. C. Hewett, Chicago, *operator*. *The patient* was one of Dr. Kulp's private patients. Two very difficult roots and a third molar were removed. Dr. Hewett applied the pigment of which he spoke in his paper, waited four minutes, then used chloroform as he directs to cause partial anæsthesia.

Dr. B. F. Eshelman, Harlan, Iowa, *operator*. Dr. W. J. McKay, Muscatine, Iowa, *patient*. Right lower first molar. Gold crown. Did not succeed in finishing the operation.

Dr. J. B. Monfort, Fairfield, Iowa, *operator*. Dr. H. N. Edwards, Des Moines, Iowa, *patient*. Compound cavity. Mesial compound of right superior first molar. Crystal mat gold and Pack's pelletts were condensed by automatic and Bonwill mechanical mallets and hand pressure.

Dr. J. G. Hollingsworth, Kansas City, *operator*. Dr. J. A. Curry, Streator, Ill., *patient*. First superior right bicuspid porcelain faced crown. Dr. Hollingsworth used his method of making the cusps. The articulation was obtained by waxing the cusps to the band, placing it in position and allowing the patient to bite.

After the cusps were soldered to the band, porcelain was let into the gold crown.

Dr. E. T. Brigham, Watseka, Ill., exhibited Dr. J. H. Morrison's drawing and forming dies, for making seamless crowns.

Dr. Joseph Stott, Burlington, Iowa, exhibited his method of making steel and brass die plates.

Dr. F. P. Webber, Cherokee, Iowa, cut cavities in porcelain teeth by grinding the surface and then drilling with a common rat-tail file sharpened wedge shape. He also showed some fine contours for crown and bridge work. A light pure gold backing was fitted to the crown to be used and left to extend slightly beyond the tooth at the point to be built in with gold. The tooth then being ground to allow the form of filling desired, the porcelain is beveled so that when the backing is bent to form the outline of the contour required, the cavity will retain a filling. After fastening the backing to the tooth, gold is built in. An additional support for the filling is gained by folding the edge of the backing over the filling when it is partly built, and incorporating this in the filling as it is completed. This presents a very ingenious way of accomplishing the desired result.

Dr. R. H. Antes, Geneseo, Ill., exhibited an excellent method of generating gas.

Dr. W. N. Morrison, St. Louis, implanted a left superior second bicuspid. The socket was formed for the tooth. There was a simple incision made in the soft tissues, increased in size by dilation, preserving all this tissue. The process was cut with burs and a drill. The canal was filled with chloro-percha and gold points after antiseptic treatment. The tooth was inserted and retained by a figure 8 ligature of copper wire.

Friday, May 12th.

Dr. A. W. Harlan, Chicago, *operator*. Geo. C. Kenyon, Mt. Carroll, Illinois, *patient*.—Superior right central to bleach. At the age of fourteen the pulp was destroyed by a blow upon the tooth; soon the tooth became very dark, almost black. The pulp canal was filled and attempts made to bleach but without success, so the case was most unfavorable.

Dr. Harlan applied the dam and by free cutting of the dentine removed some of the thicker portions. Thorough cleansing with peroxide of hydrogen was followed by applications of chloride of alumina and a saturated solution of chlorinated soda. These ap-

plications produced a marked change for the better. An application of chloride of zinc was then sealed in the chamber to be left a month.

As this is a case that few would attempt to bleach the future reports will be very interesting to us.

Dr. Garrett Newkirk, Chicago, presented as a hot water and dry heat sterilizer for instruments a small tea kettle in the cover of which were fastened two small tin cups of different depths. After thorough cleansing the instruments are dipped into the boiling water, then placed points down in the cups and allowed to stand fifteen minutes or more, then they are oiled with oil sterilized with oil of cassia.

Dr. W. A. Stevens, Chicago, *operator*. Dr. J. E. Clark, Audubon, Iowa, *patient*.—Gold filling in superior left first molar, mesial compound cavity. Watts' crystal gold was used. The operation was to demonstrate the use of the Harris pneumatic mallet.

Dr. W. E. Harper, Chicago, demonstrated Zeller's method of casting aluminum plates.

Dr. K. M. Fullerton, Cedar Falls, Iowa, showed Logan crown with band, enamel attachment of band to crown; also demonstrated a method of retaining shape of band as fitted to root, while the band is fitted to the crown.

REPORT OF OPERATIONS PERFORMED AT PREVIOUS CLINICS.

1873. Dr. G. H. Cushing, Chicago, *operator*. Dr. C. A. Kitchen, Rockford, *patient*.—Right upper first bicuspid, disto-morsal cavity. Gold filling failed at cervical margin.

1876. Dr. J. N. Crouse, Chicago, *operator*. Dr. C. A. Kitchen, Rockford, *patient*.—Lower left second molar morsal face. Gold filling, good condition.

1881. Dr. W. N. Morrison, St. Louis, *operator*. Dr. S. F. Duncan, *patient*.—Left lower second molar mesial compound cavity. Gold filling in good condition.

1885. Dr. C. J. Tibbetts, *operator*. Dr. C. B. Sawyer, Jacksonville, *patient*.—Lower left first molar compound mesial cavity. Gold filling. Lingual wall fractured and decay progressing.

1888. Dr. D. B. Freeman, Chicago, *operator*. Dr. B. D. Wikoff, Chicago, *patient*.—Left lower second molar compound mesial cavity, surface of gold filling gone. The distal morsal of first molar failed at cervical border.

1890. Dr. Edmund Noyes, Chicago, *operator*. B. D. Wikoff, Chicago, *patient*.—Right lower second molar compound mesial cavity. Gold filling; good condition.

1890. Dr. B. Q. Stevens, Hannibal, Mo., *operator*. Dr. G. D. Sitherwood, Bloomington, *patient*. Root canal of left upper first bicuspid. Roots filled with wood points and gutta-percha; apparent absorption of process and marked inflammation. Tooth always tender.

1888. Dr. Louis Ottofy, Chicago, *operator*. Dr. Curry, Streator, Illinois, *patient*.—Implantation. Tooth in perfect condition.

E. A. Royce, Supervisor, Illinois.
Geo. W. Miller, Supervisor, Iowa.
W. E. Holland, Assistant, Illinois.

DISCUSSION.

Dr. W. T. Magill, Rock Island: There was a report made of one filling that was done in 1873. I think if the filling is in good condition at this day with a slight discoloration along the cervical margin, we may consider the operation successful. Where we find many fillings of that kind, we will find many more that will not stand that length of time.

Dr. Prichett: The supervisor in the case of the clinic given by Dr. Stevens says that had the cavity been cut away more, it would have been a better operation. I would like to ask upon what grounds he makes the criticism.

Dr. E. A. Royce, Chicago: The operation done by Dr. Stevens was for the demonstration of certain points, and in my opinion every clinic should be criticised upon that basis, and not upon general principles of the filling. If a man comes here to show a certain mallet or some other thing, the mallet should be criticised and not the operation upon general principles. If a man is to demonstrate the use of a mallet or of any appliance he should demonstrate it in the most thorough manner possible for that instrument. In the first place, to successfully fill a proximal cavity in almost every case the walls should be cut back so that the union or joint between the gold and the enamel can clear the lodgment of food entirely, leaving the knuckling portion free and clear, of gold. In the second place, in the use of mechanical mallets of all kinds there is little advantage gained by using it as an automatic mallet. I doubt if there is one man in twenty in the profession who under-

stands the philosophy of using it. They use it as they would hand pressure. Therefore the criticism was upon the manner of using the mallet and not on the manner of filling the cavity.

Dr. Stevens: The criticism is not as severe as I expected it would be. You will remember the anecdote of Abraham Lincoln and Stanton, that every man has his peculiarity, and so I have mine in the method of using the mallet. I would not under any consideration fill teeth in the manner in which Dr. Royce described with a mechanical mallet. I have used the mechanical mallet for twenty-six years. I do not believe that a man is justified in any measure in sacrificing solid dentine or enamel for the sake of replacing with gold for the exhibition of any instrument. I should consider I had done the patient under my care a moral injustice if I had cut away more of the enamel and dentine and replaced it with gold, because when I gain a firm, solid basis, the margins being firm and solid, having a direct opening of the cavity to its base, and in proper shape to retain the filling material, I have demonstrated the usefulness of the instrument, more clearly than I could have done had I destroyed more of the tooth substance to have given the instrument a better play.

SPECIAL SUBJECT DISCUSSED.

I. Local Anæsthetics.

Dr. Hewett consented to say a few words about the topic but disclaimed any knowledge not common to the profession.

That though to the ancients and to the Chinese anæsthetics, local and general, were known, and used, and in our day some of the essential oils are known to have limited obtundent effects ; yet the mode of their action he could not explain.

He claimed local anæsthetic properties for cocaine upon mucous membranes and on denuded tissues. That cocaine in powder, or in solution applied to the gums would mitigate the severity of pain caused by gilling twine or operations for pyorrhœa. The obtundent effect was immediate and sufficient, but he feared the secondary and consequential effect of its abuse more than chloroform, morphine or alcohol. He admitted that the danger from its abuse was no valid argument against its use. In concluding said: I am searching for light almost against hope, yet believing that with the combined wisdom, energy and perseverance of such men as are before me, we will yet find answer to the vexed question.

In closing, he thanked the members of the societies for polite attention paid and for the friendly spirit of the criticism. A word of appreciation comes pleasantly and criticism given in the spirit of this morning is just as welcome. He thanked them for it.

In defense of his position advising chloroform, he said that it was not fair to urge the death rate of chloroform given differently from the way that he advised. He did not know any stronger language with which to urge caution: First, against *shock* in the commencement of its use, and second, against *complete anæsthesia*, except when able medical counsel and restorative means were at hand.

He added a word of caution against cocaine, fearing its toxic and habitual use more than chloroform.

To give emphasis, and make clearer his use of chloroform as an obtundent, he claimed that in *shock* from chloroform, and not

from the operation lay the danger. That for thirty years and more, he had operated safely while the patient was conscious, and *without shock.* In the use of the cocaine pigment, he cautioned against allowing the patient to swallow any of it as too much cocaine might be taken into the stomach.

II. Is Implantation a Successful Operation?

Dr. W. N. Morrison, St. Louis: When I entered the profession I was fortunate enough to have three preceptors, in rapid succession. It was in war times, and circumstances altered cases very easily.

I was surprised and grieved at the number of teeth extracted upon one pretext or another. It seemed to commence early in life, deciduous teeth, so appropriately named, were always the cause of trouble, or if left in the jaw, would surely be the cause of trouble, and were extracted on suspicion. They will "ruin your child's mouth" if left there another day.

The six year molars, or bicuspids, were extracted for older children with the object in view of making the mouth more symmetrical. The motto in that operating room was "dead men tell no tales," and the appointment cards were handsomely engraved with a spreading rooted molar, crossed with a turnkey and forceps —skull and crossbones style—which would turn the proprietors of modern extracting rooms green with envy. Many teeth that would not shed luster behind a gold filling were extracted rather than the reputation of the operator should ever be stained by an amalgam filling.

Then in older subjects who had lost some teeth by advancing years, the remaining ones were many times needlessly sacrificed to facilitate the construction of artificial ones. In the laboratory, twenty-seven different dentures in the various stages of construction at one time, nearly all on gold or platinum bases, is an indication of what was going on in the offices of the best operators in the land at that time. My professional life has been a battle against that line of practice, which I regret to say continues to too great an extent even to this day.

Among my first impressions were that these teeth should be implanted where they would do the most good. But this did not meet with favor, as the patients lost the view of the usefulness of

the operation by the dread that at some future time the tooth would have to be again extracted. With me the planting of teeth is an indispensable operation which has been used successfully for hundreds of years, in all kinds of hands and all kinds of cases, and with as equal degree of success, as any other surgical operation. Parents of patients replant a tooth which has been knocked out by accident, sometimes the wrong side to the front, and they grow and perform their functions well. One case I know where the gentleman said he had worn the tooth thirty-five years, and I knew it to be in his mouth for ten years after that in as good condition as the adjoining teeth.

It is not a popular operation with dentists; the difficulty of getting good specimens, the question of contagion, the risk of failure, and want of professional harmony and support in case anything does happen. The patients are not anxious for the operation itself, and the specimen when ready to plant is never inviting, and they ask all manner of leading questions of genealogy, blood-relationship, personal history and previous peculiarities; and of course that is seldom known, and patients say they would rather have one from some source of their own circle, or particular selection, and when you cannot manage that for them, they say they would prefer a porcelain tooth than run any risks. Yet for any one of the ten anterior teeth where there is a good socket, or good thick process to make a socket, is an operation above all others to be preferred, even if it has to be repeated several times. The great number of successful cases warrant me in urging this line of practice. Two or three of my most succcessful cases, to my mind, overbalance any inconvenience of a dozen cases that may have been failures.

Dr. A. W. Harlan: I have, perhaps, had an experience that no member of the society in the room has had. A year ago last October, I implanted a first superior bicuspid tooth without removing the pulp or filling the roots. I simply soaked the tooth in a solution of bichloride of mercury, then implanted it. After it became firm I drilled a hole in the crown, removed the remains of the dead pulp and filled the roots. The tooth is perfectly firm to-day.

Dr. Hewett: I think I have had an experience that very few members of this society have had. When I was eight or nine years old I ran my front teeth against the forehead of a schoolmate, and

knocked out one of them, which fell into the sand. I thought to myself if a broken leg would heal, why would not a tooth grow firm. I brushed off the sand, put the tooth into the socket, brought my front teeth together and bit hard, and then ran to my mother as fast as I could. She bound up my face, applied hot water, etc., and that tooth became reattached; I wore it for over thirty years. Dr. Kulp placed a bridge in its place a few years ago. I will say a word or two about the history of that tooth. After a time it became septic, and a fistula was formed, and there was a discharge of pus finally. One day I found that it moved as though it were broken, and it gave me so much pain that I had it taken out. It had all the appearances of a deciduous tooth, and the root became absorbed. I think that tooth is in the Chicago Medical College. I sent it there.

Dr. Black: Two or three of the most successful cases to my mind overbalance a dozen cases that may have been failures. The question comes up as to what proportion of cases of failure do we require to overbalance the few successful cases and lead us to condemn operations that are of a doubtful character. If our fillings should fail within a short time, we would not be very much encouraged to fill teeth, or to do any others surgical operation that fails of its object. I remember the late Dr. David Prince used to say to his patients where life was at stake, that if there was a chance for a patient to get well and live, it was his duty to operate, even if half a dozen such cases died after operation. How far does this go in the matter of implantation? Is the success generally obtained such as to warrant us in recommending implantations generally. Or does it warrant us only in selecting the most favorable cases and making implantation? It seems to me the history of implantation is such, and the failures have been such, that the dentist is hardly justified in resorting to implantation except in the few most favorable and most necessary cases that may come into his hands.

Dr. Louis Ottofy, Chicago: Implantation has come into partial disrepute probably on account of the number of operations that were and are performed promiscuously at clinics. Almost any operation performed at a clinic is more liable to fail than if done in private practice. Teeth are used that are absolutely unsuitable. Dr. Morrison showed a tooth yesterday that he intended to implant in the mouth of a patient that he did not think was in good

condition, but it was the best he could get for the clinic. I noticed that the enamel was all cracked to pieces, and knew that it would be only a question of a short time when it would chip off beyond the margin of the gum and eventually result in the loss of the tooth. The tooth would be lost from that cause and not through failure of the operation. That implantation, when performed in specially selected cases, is a beautiful operation there can be no doubt, as is shown by cases which I have. I have implanted teeth six years ago that are in good condition to-day. A tooth must be absolutely healthy and be in first-class condition to be considered successfully implanted.

III. Do Gold Fillings of the Present Day Preserve the Teeth Better Than Those Made Forty Years Ago?

Dr. Geo. H. Cushing: I presume if Dr. Allport were here he would answer the question in the affirmative. There is no question that the *general* operations made forty years ago with noncohesive gold were more successful in the teeth than the *general* operations that are made to-day with cohesive gold. But we must remember that the teeth that are filled to-day are very different in character from those that were attempted to be filled forty years ago with noncohesive gold. The introduction of cohesive gold made possible operations that were impossible with noncohesive gold, and it introduced a method of practice that brought to bear certain strains upon the teeth which were not, and even to-day are not, realized by the general practitioner. The amount of force that is applied in the use of the mallet is very rarely justly estimated by the operator. Too often it is excessive even in the hands of careful men. The method of hand pressure gives greater security in packing gold over attenuated margins or over margins that are inclined to crumble under pressure, so that I think it may be said that the average of teeth that were filled with noncohesive gold forty years ago were more generally protected by the average operator than the average of teeth filled to-day with cohesive gold are. Dr. Allport was always a very earnest advocate of the use of noncohesive gold in combination with cohesive gold. Even where cohesive gold was used in the latter part of an operation, he was a strong advocate for the use of noncohesive gold at the cervical

borders and for the borders generally that were thin or fragile. I feel quite as earnestly about that as he did. It is the better and safer plan, and if more generally adopted there would be fewer failures of fillings at cervical margins.

Dr. Black: I do not feel like trying to remember things that occurred fifty or sixty years ago. I do not believe I filled many teeth at that time. (Laughter.) However, I did fill teeth before cohesive gold came into general use, and know something of the methods that were employed and something of the results obtained. There is no question about the value of noncohesive gold, and I think Dr. Cushing will agree with me. There are few operators now who handle noncohesive gold as we used to handle it in those days; even though they may use it they use it in a different manner entirely. I agree with Dr. Cushing entirely in the usefulness of noncohesive gold upon margins of a considerable bulk of carious teeth that are filled. But there is another element in this matter.

Comparatively few cases we undertake to-day were undertaken in those days. Teeth were extracted that we would now fill. Mouths were mutilated in those days where we would preserve them intact to-day, and not by the poorer class of operators either. We could not undertake contour fillings. The treatment of pulps had not advanced, and the cleansing of root canals had not advanced to that perfection it has to-day. All of these things should be taken into consideration in any estimate that is made of the subject. In the teeth we filled with noncohesive gold in those days we did not build up contours.

Slight contouring was done certainly, but not enough to be regarded as general contouring. With regard to the old fillings that have stood thirty and forty years, I will say that I can now find some of Dr. Harris' fillings that have been in about sixty years. There were several families of his patients who have come into my hands with fillings that he made, but those fillings are generally small ones. The mouths were apparently carefully watched and the conditions favorable. I have no doubt that forty, fifty and sixty years from now we will find under similar conditions our fillings of to-day standing good and perfect, the same as we now find those of the older men that have passed away, standing good and perfect. Fillings that are surrounded by favorable conditions will stand, and I may say right here that one of the greatest

studies that we have to make in the future is to obtain these favorable conditions and perpetuate them. We now fail to do so.

Dr. Harlan: I have never felt like discussing a subject so much as I do just now. When I think of the ghastly looking mouths with wide V spaces, and the amount of suffering and inconvenience that people had to endure in consequence of having the old-fashioned fillings of forty or fifty years ago, and think of the comfort they now have; it is worth while for any patient to undergo the filling of his teeth three times in forty years for the sake of the satisfaction during that number of years in having these spaces closed up. It does not make any difference if we do see three or four, or more fillings, that have lasted forty years, the dentistry of to-day is so far in advance of what it was forty years ago that this is not to be thought of. It is perfectly easy to fill a little cavity on the side of a tooth with noncohesive or cohesive gold and have it stay if the person remains in good health for a great many years. There is no great degree of merit in having a filling of that kind last forty years. When a filling will last for twenty years, as has the one that was referred to to-night, and made by Dr. Cushing, and the patient has used it all this time comfortably, that is something approaching the results that modern dentistry can accomplish. The peg shaped, V shaped, horrible teeth that many mouths present is frightful to contemplate. There are a number of people who had their teeth filled fifty, fifty-five and sixty years ago in the interior of New York, between Albany and Buffalo, where you can run your finger in between them in many cases. It destroys their expression. They have gone along through life absolutely deformed in consequence of the necessities for making teeth in that shape in order to have them retain fillings. Every doubtful tooth was extracted, and a good many salvable teeth were extracted, that in the hands of better men would not have been. Therefore, the civilization of the present is to be congratulated that dentistry has been able to reach a degree of perfection that will make people comfortable while masticating their food.

Dr. C. N. Johnson: I think it would be presumption on my part to compare the work of forty years ago with that of to-day, because I know nothing about the work of forty years ago except what I see and hear in regard to it. The reason I rise to my feet is this: The last discussion that Dr. Allport took part in before

any dental society was before the Chicago Dental Society when this matter was brought up. I do not think I ever came more in conflict with a man's arguments in my life than I did in that discussion, and I want to say some things that I said then. At that meeting Dr. Allport made the remark that he did not see so many of the fillings in these days still standing and doing good service as those that were made forty or more years ago. He claimed that the methods used in those days were superior to those used to-day. I cannot agree with that in any particular. I take it as no argument that because we see teeth to-day that were filled forty years ago that the work was better done then than it is to-day. We have no record of their failures.

Dr. Black: I have seen lots of them.

Dr. Johnson: We have simply a record of their successes. As Dr. Black has said, forty or fifty years from now there will be a larger percentage of our fillings seen than we see of the fillings put in forty or fifty years ago. If I did not believe that, I should consider myself a failure. It is simply a question as to whether or not we are advancing. That we are progressing cannot be denied. We are more scientific and more mechanical than ever before, and within the last few years we have developed wonderfully. When I was a student I was not taught the proper principles of the preparation of cavities. It seems to me we are doing work to-day which will stand the test of time just as well as the work done forty or fifty years ago. I have seen many amalgam fillings that have saved teeth for a very long time, as long in some cases as gold, so that it is no proof because we find gold fillings lasting such a long time that it is due to the class of work done at that time, or that it is better than we are doing to-day. If we compare past with present methods we have reason for encouragement.

Dr. Kulp: I suggested this subject to Dr. Allport for discussion because I knew his hobby. I have known him for a great many years, and I learned a great many valuable lessons because of his hobby. I make this remark, that our success of to-day in filling teeth will largely depend upon the nearness of our methods to those of forty years ago; that is to say, if we line our cavities with noncohesive (soft) foil, we can build out as much as we please, and still save the teeth. If we have the material to contour and build out better than they had, so much are we ahead of them, and our work can be better than theirs was. I firmly believe that our success largely

depends upon covering the walls of the cavity with soft gold. I have gone through the cohesive gold experimentation thoroughly. I see fillings often, put in thirty years ago that are still good. I put them there in the old fashioned way with noncohesive gold. If I had had the material to contour them at that time, I believe they would be perfect now. As it is, they are saving the teeth. The class of fillings that preserved the teeth forty years ago were principally in cavities on the grinding surfaces of molars. Every once in a while I come across one of them put in forty years ago. I believe that Dr. Allport, covered the walls of cavities with *soft foil always*, contouring with annealed soft foil, and has as good record for saving natural teeth as any one in the profession. A monument to his memory.

Dr. Royce: In regard to the filling of Dr. Cushing's which was inspected to-day, it was in perfect condition except a slight disintegration of the cervical margin.

In regard to the percentage of teeth that are preserved by filling; supposing five per cent of the old time fillings preserved the teeth forty years ago and only one per cent of our fillings of to-day remain in that length of time, are we not doing better work now than formerly, because we are filling a larger number of teeth of poor structure.

We can hardly make a fair comparison between the successful operations of forty years ago and those of to-day unless we take into consideration the quality of tooth substance.

In regard to the use of cohesive and noncohesive gold, I believe that cohesiveness or noncohesiveness has nothing whatever to do with preserving teeth, but it is that quality of the gold which allows the operator to pack it perfectly against the walls of the cavity that insures the preservation of tooth substance. I have been conducting a series of experiments which have proven to me that it is upon the spreading quality of gold that we must depend principally for the preservation of teeth. I hope I will be able to demonstrate this in the near future.

Dr. Cushing: I seem to have been slightly misunderstood in regard to advocating noncohesive gold in preference to cohesive gold for everything. I want to say further that I agree fully with what has been said about the greater number of teeth that are preserved to-day. I stated that the class of teeth filled a great many years ago was entirely different from the class of teeth we operate

on to-day, and this should be taken into consideration. I meant to make it plain that I thought teeth filled in the manner that was pursued forty years ago with noncohesive gold protected the teeth more generally than the fillings that are put in to-day, because of the difference and character of the cavities and the fact that noncohesive gold is more easily packed toward the walls than cohesive gold is, not that cohesive gold cannot be packed there, for I contend it can be as perfectly packed in such a place as ever noncohesive gold was. But it has got to be done by a master hand. Dr. Allport's theories were different from his practice. As he talked to us in societies we gathered the impression that he used nothing but noncohesive gold. He used very little noncohesive gold practically. He annealed very much of the gold he used, and while I think he used noncohesive gold at the cervical margins perhaps exclusively, in the main part of the operation he used cohesive gold. I do not want to be misunderstood as thinking that the operations of forty years ago were more successful in the sense that has been stated by the preceding speakers. I merely stated that in the class of cavities which were more favorable and the conditions more favorable, noncohesive gold was used; that the chances for the average operator properly packing noncohesive gold against the walls of the cavity are greater than where cohesive gold is used. I think anybody with any observation will know that to be true.

Dr. C. N. Johnson: I agree with Dr. Cushing that Dr. Allport conveyed the impression when speaking before societies, that he used noncohesive gold almost exclusively. When I first came to Chicago I saw him operate. I had known him by reputation as a man who used noncohesive gold, but about the first thing I saw him do was to put the gold through the flame of a lamp. Shortly after the discussion I have mentioned before the Chicago Dental Society, in walking along the street with him, I said to him that I had been under the impression that he used noncohesive gold, and he said he used cohesive gold as much as he did the former. I told him that he did not tell the profession so, and that the profession had the impression that he used noncohesive gold exclusively. He said he seldom filled a cavity without using a great deal of cohesive gold.

Before I sit down I want to pay a tribute to his ability as an operator. I do not believe his peer has ever existed in the pro-

fession. I had in my office a patient shortly after his death for whom he put in a filling two weeks before his illness, when he was weak and not in a condition to stand at his chair. It was an extremely difficult filling to insert, but it was so perfectly done that it will stand as a monument to his ability, if the patient lives, longer than any of the fillings that were put in forty or fifty years ago. (Applause.)

Dr. Black: We need a clear, concise statement of the manner of using noncohesive gold in connection with cohesive gold. So far as I know, there is not a clean-cut statement in the literature of the profession as to the means of using soft gold in connection with cohesive gold, such as Dr. Allport employed and others. The statements I see are imperfect, and certainly are not such as will enable the student or younger men coming into practice to use soft gold as it ought to be used. I hope within the next year we will get some paper upon the subject that will put this definitely, concisely and properly. It is a matter that must be pursued upon different plans. There may be a number of plans, but the plan should be definite. I hope this will be done so that the statements can be carried out and utilized by every one.

APPENDIX.

LIST OF OFFICERS

. . OF THE . .

ILLINOIS STATE DENTAL SOCIETY,

FROM DATE OF ORGANIZATION.

ORGANIZED AT CHICAGO, JULY 24, 1865.

CHAIRMAN, A. C. VAN SANT, PRINCETON. SECRETARY, E. HONSINGER, CHICAGO.

Ann'l meeting.	Year.	Place.	President.	Vice-President.	Secretary.	Treasurer.	Librarian.
1	1865[1]	Chicago.....1st.	A. C. Van Sant..Princeton.	E. Honsinger ...Chicago.	Edgar Park.....Chicago.	S. Babcock...Springfield.	T. N. Truesdell.....Elgin.
2	1866	Chicago.....2d.	H. N. Lewis.....Quincy.	O. Willson.....Aurora.	G. T. Smith...Princeton.	M. W. Sherwood.Chicago.	L. P. Haskell.....Chicago.
3	1867	Chicago.....3d.	Geo. H. Cushing...Chicago.	A. W. French.Springfield	M. S. Dean.....Chicago.	J. N. Crouse..Mt. Carroll.	W. W. Allport.....Chicago.
4	1868	Springfield.1st.	E. H. Kilbourne....Aurora.	G. P. Kingsley..Freeport.	H. J. Smith.....Quincy.	A.W. French..Springfield	M. S. Dean.....Chicago.
5	1869	Quincy.....1st.	M. S. Dean.....Chicago.	G.V. Black..Jacksonville.	C. S. Smith...Springfield.	A.W. French..Springfield	C. O. Dean..Mount Carroll.
6	1870	Bloomingt'n1st	M. S. Dean[2].....Chicago.	G.V. Black[2]..Springfield.	C. S. Smith[2]..Springfield.	A.W. French[2] Springfield	C. O. Dean[2].Mount Carroll.
7	1871[3]	Peoria.....1st.	G. V. Black ..Jacksonville.	S. C. Wilson.Bloomington	C. S. Smith...Springfield.	G. P. Kingsley..Freeport.	E. C. Stone.....Galesburg.
8	1872	Chicago....4th.	O. Willson..... ...Aurora	J. N. Crouse.....Chicago.	C. S. Smith...Springfield.	G. P. Kingsley..Freeport.	J. M. Hurtt.....Peoria.
9	1873	Rock Island 1st	J. N. Crouse .....Chicago.	S. L. Edwards ....Peoria.	C. R. E. Koch....Chicago.	S. M. Sturgiss....Quincy.	J. M. Hurtt.....Peoria.
10	1874	Jacksonville 1st	C. Stoddard Smith.Spri'g'd	E. Honsinger....Chicago.	C. R. E. Koch....Chicago.	S. M. Sturgiss....Quincy.	R. Matthews.....Pontiac.
11	1875	Ottawa .....1st.	G. S. Miles.....Jerseyville.	E. D. Swain.....Chicago.	C. R. E. Koch....Chicago.	C. A. Kitchen.....Galva.	F. W. Dean.....Pekin.
12	1876	Galesburg..1st.	E. D. Swain.....Chicago.	K. B. Davis, Petersburg.	C. R. E. Koch....Chicago.	C. A. Kitchen..Rockford.	O. Willson.....Aurora.
13	1877	Springfield..2d.	K. B. Davis ....Springfield.	E. C. Stone....Galesburg.	E. D. Swain.....Chicago.	C. A. Kitchen..Rockford.	E. B. David.....Aledo.
14	1878	Rockford...1st.	C. R. E. Koch.....Chicago.	S. M. Sturgiss....Quincy.	E. D. Swain.....Chicago.	C. A. Kitchen..Rockford.	E. B. David.....Aledo.
15	1879	Peoria.....2d.	S. M. Sturgiss.....Quincy.	C. A. Kitchen, Rockford.	Edmund Noyes..Chicago.	E. C. Stone....Galesburg.	W. W. Ormsbee....Geneva.
16	1880	Bloomington 2d	C. A. Kitchen....Rockford.	J. Frank Mariner, Ottawa	Edmund Noyes..Chicago.	E. C. Stone....Galesburg.	G. H. Harrington..Delavan.
17	1881	Rock Island 2d	J. Frank Mariner..Ottawa.	J. A. W. Davis, Galesburg	Edmund Noyes..Chicago.	E. C. Stone....Galesburg.	G. H. Harrington..Delavan.
18	1882	Quincy.....2d.	A. W. Harlan.....Chicago.	W. T. Magill, Rock Island	Edmund Noyes..Chicago.	E. C. Stone....Galesburg.	H. H. Townsend...Pontiac.
19	1883	Decatur....1st.	E. C. Stone.....Galesburg.	J. J. R. Patrick, Belleville	Edmund Noyes..Chicago.	E. S. Talbot.....Chicago.	H. H. Townsend...Pontiac.
20	1884	Springfield..3d.	Edmund Noyes....Chicago.	H. H. Townsend, Pontiac	J. W. Wassall[4]..Chicago.	J. Campbell..Blooming'n	W. B. Woodward....Peoria.
21	1885	Peoria.....3d.	H. H. Townsend...Pontiac.	M. H. Patten, Springfield	J. W. Wassall[5]..Chicago.	C. R. Dwight....Danville.	J. W. Cormany..Mt. Carroll.
22	1886	Rock Island 3d.	T. L. Gilmer.....Quincy.	W. B. Woodward, Peoria.	J. W. Wassall[6]..Chicago.	C. B. Rohland.....Alton.	W. B. Ames.....Chicago.
23	1887	Jacksonville.2d	W. T. Magill..Rock Island.	C. B. Rohland.....Alton.	J. W. Wassall[7]..Chicago.	T. W. Prichett.Whitehall	W. B. Ames.....Chicago.
24	1888	Cairo.....1st.	C. B. Rohland.....Alton.	Chas. Henry, Jackson'lle.	Garrett Newkirk.Chicago	T. W. Prichett.Whitehall	W. B. Ames.....Chicago.
25	1889	Quincy.....3d.	Geo. H. Cushing...Chicago.	J. J. Jennelle.....Cairo.	Garrett Newkirk.Chicago	T. W. Prichett.Whitehall	W. B. Ames.....Chicago.
26	1890	Springfield.4th.	T. W. Prichett..Whitehall.	Kate C. Moody, Mendota.	Garrett Newkirk.Chicago	W. A. Stevens...Chicago.	D. M. Cattell.....Chicago.
27	1891	Bloomington 3d	Truman W. Brophy.Chicago	E. K. Blair.....Waverly.	Garrett Newkirk.Chicago	W. A. Stevens...Chicago.	F. H. McIntosh..Bloom'g'n
28	1892	Springfield.5th.	W. H. Taggart...Freeport.	Garrett Newkirk.Chicago	Louis Ottofy.....Chicago.	W. A. Stevens...Chicago.	F. H. McIntosh..Bloom'g'n

[1]Two meetings were held in Chicago, July and November; all succeeding meetings were held in May.
[2]These officers held over from the previous meeting, no election being held at the close of meeting of 1869.
[3]The officers acting at this and succeeding meetings were elected and installed at the close of the previous meeting.
[4]Assistant Secretary, W. H. Taggart, Freeport.
[5]Assistant Secretary, P. J. Kester, Chicago.
[6]Assistant Secretary, P. J. Kester, Chicago.
[7]Assistant Secretary, Louis Ottofy, Chicago.

OFFICERS AND STANDING COMMITTEES.

OFFICERS, 1892-93—Rock Island.

President, E. K. Blair.....Waverly.
Vice President, C. N. Johnson.....Chicago.
Secretary, Louis Ottofy.....Chicago.
Treasurer, W. A. Stevens.....Chicago.
Librarian, F. H. McIntosh.....Bloomington.

OFFICERS, 1893-94—Springfield.

President, Garrett Newkirk.....Chicago.
Vice President, J. W. Cormany.....Mt. Carroll.
Secretary, Louis Ottofy.....Chicago.
Treasurer, W. A. Stevens.....Chicago.
Librarian, F. H. McIntosh.....Bloomington.

EXECUTIVE COUNCIL, 1893-94.

Ex Officio..... Garrett Newkirk, Chicago.
Louis Ottofy, Chicago.
W. A. Stevens, Chicago.

Terms expire 1894..... Geo. H. Cushing, Chicago.
E. H. Allen, Freeport.
A. S. Waltz, Decatur.

Terms expire 1895..... J. J. Jennelle, Cairo.
E. M. Robbins, Carthage.
E. C. Stone, Galesburg.

Terms expire 1896..... E. K. Blair, Waverly.
C. N. Johnson, Chicago.
S. F. Duncan, Joliet.

STANDING COMMITTEES.

EXECUTIVE COMMITTEE.

C. N. Johnson (term expires 1894).....Chicago.
G. W. Entsminger " 1895).....Carbondale.
J. M. Barcus " 1896).....Carlinville.

COMMITTEE ON PUBLICATION.

Louis Ottofy.....Chicago.
A. W. Harlan.....Chicago.
E. Noyes.....Chicago.

BOARD OF EXAMINERS.

W. A. Johnston (term expires 1894).....Peoria.
E. D. Swain " " 1895).....Chicago.
C. B. Rohland " " 1896).....Alton.

COMMITTEE ON DENTAL SCIENCE AND LITERATURE.

A. W. Harlan.....Chicago.

COMMITTEE ON DENTAL ART AND INVENTION.

W. B. Ames (term expires 1894).....Chicago.
J. F. Mariner " " 1895).....Chicago.
E. H. Allen " " 1896).....Freeport

COMMITTEE ON INFRACTIONS OF THE CODE OF ETHICS.

J. G. Dickson.....Carmi.
E. R. Warner.....Chicago.
F. Primrose.....Springfield.

COMMITTEE ON NECROLOGY.

J. Frank Mariner.....Chicago.
J. M. Barcus.....Carlinville.
A. J. Curry.....Streator.

CLINICS.

E. A. Royce, Supervisor.....Chicago.
A. H. McCandless, Assistant.....Rock Island.
B. D. Wikoff, Assistant.....Chicago.

LOCAL COMMITTEE OF ARRANGEMENTS.

S. L. LeCron.....Springfield.
H. M. Prickett.....Springfield.
Grafton Munroe.....Springfield.

CONSTITUTION AND BY-LAWS.

ARTICLE I.

Name.

This Society shall be called "The Illinois State Dental Society."

ARTICLE II.

Aims and Objects.

Its aims and objects are as follows: The elevation of the standard of professional education; the advancement and cultivation of dental science and literature, and the protection of the public from the evils of empiricism; the promotion of the honor, usefulness and interest of the dental profession and mutual fellowship and good feeling.

ARTICLE III.

Officers.

The officers of this Society shall consist of a President, Vice President, Secretary, Treasurer and Librarian, and such others as may be designated in the by-laws or standing resolutions.

ARTICLE IV.

Executive Council.

The management of this Society shall be vested in an Executive Council consisting of twelve active members of whom the President, Secretary and Treasurer shall constitute a part, and these shall be the officers of the Council.

ARTICLE V.

Duties of Executive Council—Election of President and Vice President. Appointment of all Other Officers, and Selecting Place of Next Meeting.

The Executive Council shall have exclusive control of all the business of the Society and their action shall be final, without review by the Society, except as otherwise provided.

At the morning session of the last day of the annual meeting the Society shall proceed to elect a President and Vice President by ballot. The first ballot shall be informal, and in no case shall a ballot be dispensed with.

The Council shall appoint or elect all other officers, and standing committees, and shall select the place of annual meeting. In case of the absence from the meeting of the President and Vice President or of any other officers, the Council shall appoint others to act in their places.

ARTICLE VI.

Election of Executive Council.

At the first election of the Executive Council held under the amended constitution, nine members shall be elected, who shall serve—three for one year—three for two years—and three for three years—their terms to be decided by lot after their election. At each subsequent annual meeting three members of the Council shall be elected by the Society to serve for three years.

ARTICLE VII.

Quorum.

Seven members of the Executive Council shall be necessary to constitute a quorum. If at any annual meeting a quorum should fail to be present, the members of the Council present shall appoint enough members of the Society to constitute with themselves a quorum, who shall serve until the arrival of the regular members of the Council.

ARTICLE VIII.

Members.

Section 1.—This Society shall consist of Active, Corresponding and Honorary Members.

Active Members.

Sec. 2.—The Active members shall consist of practitioners of dentistry residing in the State of Illinois (except as provided in Section 5, Article VII, of the By-Laws). They shall be twenty-one years of age, of good moral character, and shall have received a diploma from a respectable Medical or Dental College, or shall have been engaged three years in the practice of dentistry, including term of pupilage, and shall have passed a satisfactory examination before the Board of Examiners.

Corresponding Members.

Sec. 3.—Corresponding Members shall consist of practitioners of dentistry or medicine residing in this or other States of the Union, or in foreign countries, who manifest a disposition to advance the science and art of the profession by contributing to its literature.

Honorary Members.

Sec. 4.—Honorary Members shall consist of persons who have made valuable contributions to the science or art of dentistry, or have rendered important services to the profession.

ARTICLE IX.

Powers.

The Society shall use one common seal, with such device and inscription as it shall agree upon; and may, by vote of the Council, grant to its members such certificates as may authenticate their membership.

ARTICLE X.

Amendments.

The Constitution may be altered or amended, with the consent of two-thirds of the members of the Society present—the proposition stating the amendment (in writing) to be submitted by five members at an annual meeting and to lie over until the next annual meeting.

If the purpose and scope of such alterations or amendments be announced in writing at the annual meeting, or, if a general revision is desired to be made, and the society, or its executive council, shall appoint a committee to determine the details of such amendments, or to make such revision, the publication in the "Transactions" of such changes as are proposed to be made, or of such revised constitution, shall be deemed a sufficient compliance with the requirements of this section, and such proposed alterations, amendments, or revision, may be adopted or rejected at the next annual meeting thereafter.

BY-LAWS.

ARTICLE I.

OFFICERS.

Duties of the President.

Section 1.—The President shall preside at all meetings of the Society and Council, call special meetings of the Society at the request of ten active members, and of the Council at the request of three of its members; sign all diplomas, certificates, or letters testimonial; appoint all committees not otherwise provided for, and be *ex officio* a member of all standing committees.

Duties of the Vice President.

Sec. 2.—The Vice President shall, in the absence of the President, preside; and in case of the absence of both of these officers, a President *pro tempore*, shall be appointed by the Council.

Duties of the Secretary.

Sec. 3.—The Secretary shall keep minutes of all meetings, both of the Council and Society; notify officers and members of their election; give notice to members of all meetings; sign all diplomas, certificates and letters testimonial; receive all moneys due the Society from its members, and pay the same to the Treasurer, and certify to all official acts of the Society in connection with the President. He shall take charge of and conduct the correspondence of the Society, and shall keep a copy of all official letters he may write, with replies to the same. He shall be Chairman of the Publication Committee.

Duties of the Treasurer.

Sec. 4.—It shall be the duty of the Treasurer to keep all moneys of the Society committed to his trust; to pay them over by order of the President, countersigned by the Secretary, and keep a correct account of the same in a book pro-

vided for that purpose. He shall make a full and detailed report of the financial affairs of the Society at the annual meeting each year; and at the expiration of his term of office, he shall deliver to his successor all funds, papers and books relating thereto.

Duties of the Librarian.

Sec. 5.—The Librarian shall have charge of all books and manuscripts belonging to the Society. He shall keep an accurate catalogue of the same, and shall report at the annual meeting the condition of the Library, and contributions made to it during the year.

Publication Committee.

Sec. 6.—The President shall appoint annually, after the election of officers, two members of the Society, who shall act in conjunction with the Secretary, as the Publication Committee.

They shall be authorized to employ a competent reporter to furnish an accurate report of the proceedings of each meeting.

They shall superintend the publication and distribution of such portions of the Transactions as the Council may direct, or the committee judge to be of sufficient value, and shall have full authority and power to cut down, amend or leave out such matter as they deem best for the proper preparation of the Transactions for publication.

They shall specify, in their annual report, the character and cost of the publications of the Society during the year, and the number of copies still on hand. Any report or other paper entitled to publication in the volume of the Transactions for the year in which it shall be presented to the Society must be placed in the hands of the Publication Committee on or before the last day of the annual meeting, and must be also so prepared that the proof sheets furnished the authors shall be returned without material alteration or addition.

Every paper received by this Society, and all plates and other means of illustration, shall be considered the exclusive property of the Society, and shall be published for its benefit.

Disclaimer.

This committee is hereby instructed to print, at the beginning of each volume of the Transactions, the following disclaimer, *viz.*; "The Illinois State Dental Society, although formally accepting and publishing the reports of the various committees, and the essays read before it, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution."

ARTICLE II.

Election of the Executive Council.

At the election held first after the adoption of this amended Constitution, nine persons shall be chosen by the Society for members of the Executive Council, to serve for terms of one, two and three years respectively, or until their successors are duly qualified, and thereafter three members shall be elected annually to serve three years.

They shall be nominated with special reference to their fitness by a committee of three, to be appointed by the President, and only confirmed by a two-thirds affirmative vote of the members of the Society present.

The election of new members of the Council annually shall be held on the morning of the last day's session, but those newly elected shall only enter upon their duties after the close of the annual meeting at which they were elected.

ARTICLE III.

Duties of Executive Council.

The Executive Council shall have the absolute control of the entire business of the Society—and shall sit with closed doors.

How Business Shall be Brought Before the Council.

Any member of the Society desiring to bring any matter of business before the Council must do so in writing, and may appear before them to advocate any such measure by consent of the Council.

Whom They Shall Elect and Appoint.

They shall annually elect a Secretary, Treasurer and Librarian and appoint one member of the Executive Committee, one member of the Board of Examiners, a Committee of three on Ethics, a Supervisor of Clinics, a member of the committee on Dental Science and Literature, a member of the Committee on Dental Art and Invention and a Local Committee of Arrangements.

Officers and Members of Old Committees to Hold Over.

The officers of the Society and the members of the Executive Committee, of the Board of Examiners and of the Committee on Dental Science and Literature and of Dental Art and Invention who are in office at the time this constitution goes into effect shall continue in office till their full terms expire.

Auditing Committee.

The Executive Council shall annually appoint an Auditing Committee from their own number.

How Moneys Shall be Voted.

They shall vote no moneys to be paid for other than the legitimate expenses of the Society except upon a three-fourths vote of all the members of the Council present.

Presiding Officer not to Vote Except in Case of a Tie.

The presiding officer of the Council shall not vote on any question, except in case of a tie, when he shall cast the deciding vote.

ARTICLE IV.

Duties of Executive Committee.

The Executive Committee shall provide a suitable hall for meetings and prepare the program of scientific work and order of business for each annual session, and attend to such other business as the Council may direct.

ARTICLE V.

Duties of Board of Examiners.

The Board of Examiners shall satisfy themselves by examination, or in any other manner they may think necessary, of the reputable character and professional qualifications of all candidates for membership, and recommend for election such as they find to be worthy.

ARTICLE VI.

Vacancies in the Board of Examiners.

In case of the absence from any meeting of one or more members of the Board of Examiners, the Council shall appoint substitutes to act *pro tempore*, and in case of a vacancy, occurring by death or otherwise, they shall, at the earliest time practicable thereafter, appoint some member to fill the unexpired term of such vacating member.

ARTICLE VII.

Election of Members.

Section 1.—Candidates for membership must be proposed to the Board of Examiners, recommendations for the same being made in writing by two members of the Society, accompanied by the initiation fee, said fee being returnable to the applicant in case of rejection. The Board shall proceed to examine such candidates in accordance with the provisions of Article V. of these By-Laws, as early thereafter as practicable. Three-fourths of all the votes cast by the Council shall be necessary for the election of a member.

Sec. 2.—No person shall be entitled to the privileges of active membership until he shall have signed the Constitution and paid the initiation fees and dues. If he omit the same for one year his election shall be void.

Sec. 3.—No person having once been a member of this Society who has forfeited his membership by the nonpayment of his dues, shall be eligible to reëlection until the amount due from him at the time he was dropped be paid.

The names of all candidates recommended by the Board of Examiners for active membership shall be posted conspicuously in the room where the Society meets, and shall not be voted on until the daily session of the Council next following the posting.

Any member of the Society knowing of any reason why a candidate for membership should be rejected, shall notify the Board of Examiners and the Council through its presiding officer, in writing of such reasons.

Any candidate for membership who has once been voted upon and rejected, shall not have his name proposed again until the next annual meeting.

Corresponding and Honorary Members—How Elected.

Sec. 4.—The names of candidates for Corresponding or Honorary membership shall be presented to the Board of Examiners only upon the recommendation of ten active members.

The Board shall recommend them for election only after satisfying themselves that they have the qualifications provided for in Secs. 3 and 4, Article VIII.

of the Constitution ; and such names shall upon no occasion be presented to the Council, except by the Board of Examiners, who shall, in reporting names for Corresponding or Honorary membership, state what work the candidates have done entitling them to be so presented.

If any Corresponding member shall enter upon the practice of dentistry in this State, his corresponding membership shall thereupon cease.

Active Members Removing from the State.

Sec. 5.—Active members removing from the State may retain their membership by notifying the Secretary of their desire to do so and by regularly paying their dues.

ARTICLE VIII.

Initiation Fee and Annual Dues.

Section 1.—The initiation fee shall be five dollars. The annual dues shall be five dollars, payable in advance, on the morning of the first day's session of the annual meeting. No member shall be entitled to the privileges of the floor until his dues are paid. Any member who neglects to pay his annual dues two successive years, shall cease to be a member without action of the Society, *provided* the Secretary has notified him of his indebtedness.

What Members are or may be Exempt from Dues.

Corresponding and Honorary members shall be exempt from the payment of all dues; and as a mark of honor for distinguished services in the profession, by special action of the Society, the dues of an active member may be remitted. An active member having paid annual dues for twenty-five consecutive years, shall be constituted a life member, and shall be exempt from payment of dues.

ARTICLE IX.

Duties and Privileges of Members.

Section 1.—An active member shall not accept a student for a less period than three years, and shall require each student to give a written obligation to graduate at some regularly organized dental college before he assumes the responsibilities of a dental practitioner.

Sec. 2.—Active members shall be entitled to debate and vote on all questions discussed in the Society, and eligible to any office in its gift, provided their dues are fully paid.

Sec. 3.--Corresponding and Honorary members shall be entitled to a seat in meetings of the Society, and have the privilege of debating all questions of a professional or scientific character.

ARTICLE X.

Resignation or Expulsion of Members.

Section 1.—Any member shall have leave to resign (except in cases of impeachment), upon application made therefor in writing ; *provided* all arrears due from him to the Society have been discharged.

SEC. 2.—Any member may be impeached by three members, for violating the laws of this Society, for malpractice, or other gross misconduct. All charges shall be made in writing with specifications, clearly setting forth each violation of the code of ethics governing this body. The member so impeached shall have transmitted to him a written copy of the impeachment, with notice of the time of hearing, before a committee of five members appointed for that purpose; then if the report of said committee sustain such impeachment, the Council, at the next regular meeting, may, by ballot, suspend or expel such member, by a majority of three-fourths of all the votes cast.

COMMITTEE ON ETHICS.

SEC. 3.—There shall be appointed annually, by the Executive Council, a Committee on Ethics, to consist of three members, to whom all complaints shall be submitted, and through whom alone shall cases of infractions of the code be brought before the Council.

ARTICLE XI.

No member shall speak on any question unless his dues are paid, and until his name has been announced by the presiding officer, nor shall any one speak more than twice upon one subject, nor to exceed fifteen minutes in all, unless by affirmative vote of the Society.

ARTICLE XII.

ANNUAL MEETINGS.

SECTION 1.—The annual meeting shall be held in May, commencing on the second Tuesday at 10 o'clock A. M., and shall be devoted to the reading and discussion of papers and such other business as shall relate to the interests of the profession, concluding with the election of officers during the last daily session. Ten active members shall be necessary to constitute a quorum for the transaction of business at any meeting of this Society.

The Executive Council shall meet at 9 o'clock A. M., preceding the meeting of the Society, and shall hold a session before each daily session of the Society if necessary. They may be called together at any time during the year by the President, upon the request of three members of the Council.

SEC. 2.—None but members of this Society shall be present during elections; *provided* an active member of the Society calls for the enforcement of this section.

SEC. 3.—It shall be the duty of the Society at each regular meeting, to appoint one of its members to deliver an address at the next regular meeting.

ARTICLE XIII.

ALTERATIONS OR AMENDMENTS.

SECTION 1.—These By-Laws may be altered or amended at any regular meeting by a vote of two-thirds of the members of the Society present, *provided* said alteration or amendment shall have been presented at a previous meeting.

If the purpose and scope of such alterations or amendments be announced in writing at the annual meeting, or, if a general revision is desired to be made, and

the society, or its executive council, shall appoint a committee to determine the details of such amendments, or to make such revision, the publication in the "Transactions" of such changes as are proposed to be made, or of such revised By-Laws, shall be deemed a sufficient compliance with the requirements of this section, and such proposed alterations, amendments, or revision, may be adopted or rejected at the next annual meeting thereafter.

ARTICLE XIV.

Rules of Order.

Robert's Rules of Order shall be the Code of this Society.

ARTICLE XV.

This Constitution shall go into effect immediately upon its adoption, and it shall be the duty of the presiding officer at once to appoint a Nominating Committee, as provided in Article II. of the By-Laws, and said committee shall as soon thereafter as possible present the names of the Executive Council, and the vote be then immediately taken.

STANDING RESOLUTIONS.

Supervisor of Clinics.

Resolved, That a Supervisor of Clinics shall be appointed annually by the Executive Council to serve one year.

The duties of such Supervisor shall be to make all arrangements for the holding of clinics, to have charge of the clinic rooms, fixtures, etc., and to determine who may or may not operate, what operations shall be performed, etc., etc. He shall keep a record of all operations in a book provided for that purpose, and shall report to the Society annually at the second daily session after the holding of the clinics.

His report shall contain as thorough a criticism of each operation as possible, setting forth all the steps he may have deemed incorrect or otherwise, a statement of what he would have thought a better method, and his reasons therefor—to the end that profitable and instructive discussion may follow. He shall also report, as far as possible, the condition of operations made at the clinics of previous years.

He may appoint one or more assistants, as may be required.

He shall notify each clinical operator to supply himself with all needed instruments and appliances for the proper performance of his operations, and request him to select for himself an assistant.

Alternates shall also be selected and notified.

Duties of Librarian.

Resolved, That after this date (May 1885), it shall be the duty of the Librarian to obtain cabinet photographs, so far as possible, of all the members of this Society deceased. and likewise of the present members, and to properly arrange the

same in suitable albums to be procured by him; and the photographs of future members shall be added to the collection.

The Librarian shall be the custodian of these albums, and shall bring them to each annual meeting for the inspection of the members.

Resolved, That the following Committees be created :

Committee on Dental Science and Literature.

First, a Committee consisting of one member on Dental Science and Literature, whose duty it shall be to report annually, on the first day of the annual meeting, on the progress of science and literature as appertaining to dentistry and give a resumé of all that may be new and important.

Committee on Dental Art and Invention.

Second, a Committee consisting of three members on Dental Art and Invention, whose duty shall be to report on the first day of each annual meeting, the advance made during the year in the arts and inventions appertaining to dentistry. This Committee shall exhibit the new devices and methods pertaining to the practice of dentistry, which are brought before the Society, in a room specially provided for that purpose.

The members of this committee shall be selected with reference to their special fitness for those duties, and be appointed by the Council.

The term of office shall be for three years after the first appointment, which shall be for one, two and three years.

Distribution of Transactions.

Resolved, That the official transactions shall not be supplied to members in arrears for annual dues ; but it shall be the duty of the Secretary to notify all delinquents of this action previous to the publication of the transactions.

CODE OF ETHICS.

ARTICLE I.

Section 1. The dentist should be ever ready to respond to the reasonable wants of his patrons, and should fully recognize the obligations involved in his duties toward them. As, in many cases, they are unable to comprehend the operation or service performed, or to correctly estimate its value, the practitioner must be guided by his own sense of right, in treating the case as his superior knowledge dictates. His manner should be gentle and sympathetic, and yet sufficiently firm to enable him to secure the best results of his skill. He should gain the confidence of his patrons, not alone by the skillful performance of difficult operations, but also by attending carefully and conscientiously to the simpler cases committed to his care.

Sec. 2. The dentist, without being obtrusive or pedantic, should impart such information to his patrons as his opportunities afford him in regard to the causes and nature of the disease in the teeth, or adjacent parts, which he may be called upon to treat; and should explain to them the importance of availing them-

selves of such timely preventives or remedies as he may deem necessary to their welfare. He should also communicate such general information as shall enable them to exercise an intelligent appreciation of what the profession aims to accomplish.

SEC. 3. The dentist shall be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill which they have a right to expect.

ARTICLE II.

SECTION 1. Every member of the dental profession is bound, as such, to maintain the honor and integrity of the profession. To this end, he should himself be upright and courteous in his intercourse with the public and his brethren in the profession.

SEC. 2. It is unprofessional to resort to public advertisements, such as cards, handbills, posters or signs calling attention to peculiar styles of work, prices for services, special modes of operating, or to claim superiority over neighboring practitioners; to publish reports of cases, or certificates in the public prints; to go from house to house soliciting or performing operations; to circulate or recommend nostrums, or to perform any other similar acts. But nothing in this section shall be so construed as to imply that it is unprofessional for dentists to announce in the public prints, or by card, simply their names, occupation, and place of business; or in the same manner to announce their removal, absence from, or return to business; or to issue, to their patients appointment cards, with a fee bill for professional services thereon.

SEC, 3. The dentist, when applied to, for merely advice or temporary relief, by the patient of a reputable practitioner, whose services at that time he is unable to procure, should guard against disparaging the family dentist by hints, inquiries, or any other means calculated to weaken the patient's confidence in him. At the same time the dentist should not, from too high a sense of professional courtesy to his neighboring practitioner, allow the interests of persons so applying for counsel or service, to be jeopardized.

SEC. 4 And it shall be regarded as unprofessional to warrant operations or work as an inducement to patronage.

ACTIVE MEMBERS, 1893.

Name.	Address.	Elected.
Allen, E. H.*	Freeport	1883.
Ames, W. B.	34 Washington Street, Chicago	1884.
Antes, R. H.*	Geneseo	1873.
Baldwin, A. E.	828 West Adams Street, Chicago	1887.
Banes, J. D.	65 Randolph Street, Chicago	1891.
Barcus, J. M.*	Carlinville	1889.
Beckwith, T. W.	Sterling	1881.
Black, G. V.* *Life Member*	Jacksonville	1868.
Blair, E. K.*	Waverly	1887.
Brigham, E. T.*	Watseka	1889.
Brophy, T. W.	96 State Street, Chicago	1876.
Brown, A. E.	1911 Michigan Avenue, Chicago	1882.
Brown, J. B.	Bloomington	1892.
Bull, H. B.	Fairbury	1892.
Call, E. B.	Peoria	1870.
Campbell, J.	Bloomington	1875.
Campbell, S. A.	Mattoon	1886.
Carson, C. W.	3872 Cottage Grove Ave., Chicago	1892.
Cattell, D. M	34 Monroe Street, Chicago	1889.
Chappell, O. A.	Elgin	1887.
Christmann, G. A.	95 Fifth Avenue, Chicago	1881.
Cigrand, B. J.*	Cor. North and Milw. Ave., Chicago	1893.
Clark, A. B.	34 Washington Street, Chicago	1876.
Clusmann, L.	360 Blue Island Avenue, Chicago	1892.
Collins, J. W.	Lincoln	1883.
Corbett, C. C.	Edwardsville	1892.
Cormany, J. W.*	Mt. Carroll	1878.
Costner, H. A.	5 43d Street, Chicago	1892.
Coulson, D. E.*	Galesburg	1890.
Crissman, Ira B.*	271 North Clark Street, Chicago	1890.
Crouse, J. N., *Life Member*	2231 Prairie Avenue, Chicago	1865.
Cummins, J. T.	Metropolis City	1888.
Curry, A. J.*	Streator	1892.
Cushing, G. H.* *Life Member*	31 Washington Street, Chicago	1865.
Damron, G. H.	Arcola	1892.
David, E. B.	Aledo	1873.
Davis, J. A. W.*	Galesburg	1872.
Davis, K. B., *Life Member*	Springfield	1869.
Davis, L. L.*	524 W. Van Buren Street, Chicago	1885.

*Present

Name.	Address.	Elected.
Dayan, L. F.	118 53d Street, Chicago	1885.
Daymude, O. M.*	Monmouth	1893.
Dennis, G. J*	257 31st Street, Chicago	1890.
Dennis, G. W.	La Salle	1886.
Dickson, J. G	Carmi	1888.
Dillon, G. B.	Sterling	1886.
Dorn, C. P	Naperville	1880.
Duncan, E.	Jacksonville	1877.
Duncan, S. F.*	Joliet	1881.
Dunn, J. Austin	70 Dearborn Street, Chicago	1887.
Eiles, F. Stanley*	Blue Island	1893.
Entsminger, G. W.	Carbondale	1888.
Fischer, Vincent*	570 Blue Island Avenue, Chicago	1892.
Fishburn, J. M*	El Paso	1884.
Fisher, J. W.*	Bloomington	1876.
Fitch, H. H.	Pekin	1883.
Freeman, A. B.	580 W. Madison Street, Chicago	1889.
Freeman, A. W., *Life Member*	34 Washington Street, Chicago	1865.
Freeman, D. C.	4000 Drexel Boulevard, Chicago	1872.
Freeman, I. A.	103 State Street, Chicago	1885.
Gardiner, F. H.	31 Washington Street, Chicago	1877.
Gardner, T. D.	Quincy	1889.
Gilbert, G. N.	Pana	1890.
Gilmer, Thos. L.*	53 33d Street, Chicago	1872.
Gluesing, J. W.*	Moline	1893.
Goebel, Robert	Lincoln	1884.
Goodmanson, J. Sidney*	Tiskilwa	1893.
Gordon, Byron*	Moline	1893.
Green, W. F.	South Evanston	1892.
Greene, E. J.	Peoria	1877.
Griffith, P. R.	Bloomington	1891.
Guffin, E. L., *Life Member*	Geneseo	1882.
Gunnell, J. S.	Normal	1891.
Günther, H. Alfred*	3300 Cottage Grove Ave., Chicago	1892.
Hanaford, M. L.	Rockford	1878.
Harlan, A. W.*	Masonic Temple, Chicago	1872.
Harper, W. E.*	3500 State Street, Chicago	1893.
Harris, A. J.	279 Warren Avenue, Chicago	1886.
Helm, C. B.*	Rockford	1893.
Henry, Chas., *Life Member*	Jacksonville	1868.
Hilton, John*	Freeport	1893.
Hinkins, J. E.*	131 53d Street, Chicago	1888.
Holland, W. E.*	Jerseyville	1889.
Honsinger, E. *Life Member*	318 Park Avenue, Chicago	1865.
Howe, A. O.	70 State Street, Chicago	1891.

*Present.

Name.	Address.	Elected.
Hunter, H. L.	Clinton	1892.
Jennelle, J. J.*	Cairo	1887.
Johnson, C. N.*	31 Washington Street, Chicago	1886.
Johnston, W. A.	Peoria	1891.
Keefe, J. E.	31 Washington Street, Chicago	1888.
Kester, P. J.	582 West Madison Street, Chicago	1882.
Kitchen, C. A.* *Life Member*	Rockford	1865.
Koch, C. R. E., *Life Member*	213 31st Street, Chicago	1867.
Lambert, Edmund	Springfield	1890.
Laurance, R. N.	Lincoln	1879.
LeCron, D. O. M.*	Rockford	1892.
LeCron, S. L.*	Springfield	1891.
Lionberger, J. M.	Dallas City	1871.
Lumpkin, L. A.	Mattoon	1886.
Magill, W. T.*	Rock Island	1871.
Mariner, J. Frank*	Lake Ave. and 13d St., Chicago	1872.
Marshall, J. S.	34 Washington Street, Chicago	1883.
Martin, W. C.	Peoria	1881.
Matteson, A. E. *Life Member*	3700 Cottage Grove Ave., Chicago	1869.
Matteson, C. F.	50 35th Street, Chicago	1872.
Meerhoff, C. E.	1603 North Clark Street, Chicago	1891.
Merriman, Chas. J.	96 State Street, Chicago	1891.
Munroe, Grafton*	Springfield	1890.
McCandless, A. H.*	Rock Island	1892.
McCandless, A. W.*	Masonic Temple, Chicago	1892.
McIntosh, F. H.*	Bloomington	1884.
McMillan, Geo. A.	Alton	1891.
Nelson, Nels.	230 Milwaukee Avenue, Chicago	1882.
Newkirk, Garrett*	31 Washington Street, Chicago	1880.
Noyes, Edmund*	65 Randolph Street, Chicago	1892.
Oakey, A. J	63d and Wright Streets, Chicago	1892.
Ormsbee, W. W., *Life Member*	Geneva	1865.
Ottofy, Louis*	Masonic Temple, Chicago	1881.
Palmer, Byron S.	631 Washington Boul., Chicago	1889.
Patrick, J. J. R.*	Belleville	1881.
Pearce, R. M.*	Rock Island	1891.
Peck, A. H.	65 Randolph Street, Chicago	1890.
Perry, E. J.	Tacoma Building, Chicago	1890.
Phillips, L. T.	Nashville	1883.
Place, E. H.	Freeport	1891,
Prichett, T. W.*	Whitehall	1877.
Prickett, H. M.	Springfield	1890.
Priestman, W. H.	Pontiac	1883.
Primrose, F.*	Springfield	1892.
Pruyn, C. P.	70 Dearborn Street, Chicago	1876.
Rayburn, J. R.*	Fairbury	1890.

*Present.

Name.	Address.	Elected.
Raymond, Frank J.*	Canton	1890.
Reid, J. G.	70 Dearborn Street, Chicago	1882.
Richards, W. P.	Elgin	1886.
Robbins, E. M.*	Carthage	1882.
Roberts, Benj. J.	516 Lincoln Avenue, Chicago	1890.
Roberts, N. J.	Waukegan	1886.
Robinson, S. G.	58 43d Street, Chicago	1892.
Rohland, C. B.*	Alton	1874.
Ross, F. R.*	3904 Indiana Avenue, Chicago	1891.
Royce, E. A.*	721 Washington Boul., Chicago	1886.
Salomon, G. S.	Masonic Temple, Chicago	1885.
Salter, G. B.	31 Washington Street, Chicago	1871.
Sawyer, C. B.*	Jacksonville	1887,
Schadel, A. C.	Warren	1871.
Schuhmann, H. H.	103 State Street, Chicago	1892.
Sitherwood, G. D.*	Bloomington	1880.
Skidmore, L. W.*	Moline	1891.
Slyfield, G, H.	Waukegan	1887.
Smith, C. Stoddard*.	34 Washington Street, Chicago	1887.
Smith, Gilman T.	Princeton	1885.
Smith, T. H.	Bloomington	1891,
Sprinkle, J. M.	Nokomis,	1893.
Stevens, W. A.*	2361 Wabash Avenue, Chicago	1876.
Stewart, E. H.	Joliet	1890.
Stone, E. C.* *Life Member*	Galesburg,	1866.
Stover, F. G.*	Rockford	1893.
Swain, Edgar D. *Life Member*	65 Randolph Street, Chicago	1867.
Swartz, M. W.	Peoria	1882.
Swasey, J. A.	3017 Michigan Avenue, Chicago	1876.
Taggart, W. H.*	Masonic Temple, Chicago	1880.
Taylor, C. R.	Streator	1880.
Thayer, C. H.	245 State Street, Chicago	1885.
Tibbets, C. J.	Quincy	1882.
Tobey, R. E.	Pana	1890.
Tobey, W. W.	Pana	1889.
Townsend, H. H.*	Pontiac	1871.
Trompen, C. N.	Roseland	1892.
Tuller, R. B.	946 W. Madison Street, Chicago	1892.
Waltz, A. S.	Decatur,	1877.
Warner, E. R.*	104 22d Street, Chicago	1882.
Wassall, J. W.*	208 Dearborn Avenue, Chicago	1882.
West, C. H.	Farina	1892.
Widenham, J. C.	Jacksonville	1877.
Wikoff, B. D.*	Masonic Temple, Chicago	1888.
Wonderly, T. G.	Galena	1881.
Woolley, J. H.	70 Dearborn Street, Chicago	1877.
Yorker, F. V.	48 43d Street, Chicago	1892.

*Present.

CORRESPONDING MEMBERS.

Name.	Address.	Elected.
Anderson, Eli W.	15½ E. Washington St., Indianapolis, Ind.	1887.
Baldwin, C. V.	Los Angeles, Cal.	1885.
Barrett, W. C.	208 Franklin Street, Buffalo, N. Y.	1881.
Bowman, G. A.	2602 Locust Street, St. Louis, Mo.	1881.
Bronson, Geo. A.	3201 Washington Avenue, St. Louis, Mo.	1881.
Cochran, R. L.	Burlington, Iowa	1885.
Cunningham, Geo.	2 King's Parade, Cambridge, England	1888.
Dean, F. W.	Des Moines, Iowa	1884.
French, D. Gale	Pittsburgh, Pa.	1881.
Fuller, A. H.*	Columbia Building, St. Louis, Mo.	1880.
Grevers, J. E.	13 Oude Turf Markt Amsterdam, Holland	1888.
Harper, John G.	800 Pine Street, St. Louis, Mo.	1892.
Hughes, E. E.	Des Moines, Iowa,	1885
Hurtt, J. M.	Pomona, Cal.	1890.
Levett, M. M.	10 Boul. des Capucines, Paris, France	1888.
Magitôt, E.	8 Rue des Saintes Pères, Paris, France	1888.
Morrison, John B.	9 When Block, Indianapolis, Ind.	1882.
Patrick, Geo.	Bolton, England	1890.
Reed, J. W.	Mexico, Mo.	1883.
Reed, Thos. W.	Macon, Mo.	1883.
Spalding, C. W.	River Point, R. I.	1880.
Stutenroth, C. W.	Watertown, S. D.	1884.
Sylvester, A. H.	2 Sommer Strasse, Berlin, Germany	1888.
Templeton, J. G.	Pittsburgh, Pa.	1881.
Tomes, Charles S.	39 Cavendish Square, London, England	1888.
Van Marter, J. G.	81 Via Nazionale, Rome, Italy	1888.
Walker, J.	22 Grosvenor Street, London, England	1888.

Total, 27. Number present, 1.

HONORARY MEMBERS.

Brewer, F. A.	San Francisco, Cal.	1869.
Butler, C. R.	Cleveland Ohio	1874.
Chase, H. S.	910 Olive Street, St. Louis, Mo.	1869.
Chittenden, C. C.	Madison, Wis.	1872.
Crowley, C. Geo.	1358 Lexington Avenue, New York City	1885.
Eames, W. H.	2602 Locust Street, St. Louis, Mo.	1867.
Hardtner, J.	Springfield, Ill.	1877.
Ingersoll, L. C.*	Keokuk, Iowa	1873.
Kulp, W. O.*	Davenport, Iowa	1871.

* Present.

Name.	Address.	Elected.
Miller, W. D.	46 Voss Strasse, Berlin, Germany.	1885.
Morrison, James B.	1422 Baltimore Avenue, Kansas City, Mo.	1869.
Morrison, W. N.*	1401 Washington Avenue, St. Louis, Mo.	1871.
McKellops, H. J.	2630 Washington Avenue, St. Louis, Mo.	1868.
Porre, R. J.	278 Race Street, Cincinnati, Ohio	1868.
Rathbun, R. S.	Clinton, Iowa	1872.
Taft, J.*	122 W. 7th Street, Cincinnati, Ohio	1874.
Wilson, I. P.*	Burlington, Iowa	1871.

Total, 17. Number present, 5.

ROLL OF HONOR.

"Specially Honored by the Society."

Black, G. V.*.....1889. Cushing, Geo. H.*.....1889.

RESUME.

		Total.	Present.
Active Members in Illinois (except Chicago)	106	177	43
Chicago	71		25
Corresponding Members		27	1
Honorary Members		17	5
		221	74

*Present.

MINUTES

OF

JOINT MEETING,

ILLINOIS STATE DENTAL SOCIETY

AND

IOWA STATE DENTAL SOCIETY.

FIRST DAY—TUESDAY, MAY 9TH—MORNING SESSION,

AT DAVENPORT.

The Executive Committees of the Illinois State Dental Society and of the Iowa State Dental Society having arranged for joint sessions for the reading of papers and their discussion, the Illinois State Dental Society arrived at the Masonic Temple, Davenport, at 10:45 A. M.

After President Fullerton, of the Iowa State Dental Society, called the meeting to order, Dr. Wm. O. Kulp, of Davenport, said:

Mr. President: As Chairman of the Executive Committee of the Iowa State Dental Society, I have the pleasure of presenting to you the members of the Illinois State Dental Society, who have come over on this side to meet with us in a joint session, the time to be divided between Davenport and Rock Island.

Dr. Fullerton then delivered the following address of welcome:

Members of the Illinois State Dental Society, Ladies and Gentlemen:

It becomes my duty to bid you a hearty welcome here to-day. It is with *pleasure* and *honor* that we receive you believing that by our mingling together we will be enlightened in the understandings of our profession.

On an occasion of this kind the magic power fails to lend us an artistic touch to portray a picture in words of the enthusiasm felt in our hearts.

Never but once before in the history of our existence as a society have we had the honor of meeting with you in a joint session, and, but few are left and

now here to relate the proceedings of that meeting. The records show it to be one of the most profitable sessions ever held in those days.

We have progressed since then, and the lines which trace the transactions of that meeting stand but as a shadow in the progressive age of dentistry of to-day.

With fingers of dust we turn those sacred leaves and with lips of ashes recite the most stupendous truths, which shook the very human soul in those times.

Let us look at the present, for who could be content to climb and when upon the mystic mountain he could only look into a dark gulf of despair from which comes no echo.

It has truly been said that we are at the dazzling electric light era of the progress of our profession, and that the Edisons are lighting up the universe with our information.

We must put on the bright armour which will reflect back the morning sun of intellect.

We advance in the proportion that we mingle our thoughts with our labor, and fellow men.

If the amalgamation of races will in a few generations produce a superior race of beings it is only reasonable to predict that by the association of these minds we may look for a great improvement in scientific research.

Let us lift the veil which conceals the future and cast our glances down the vista of coming time, and the visionary prophet would be at loss to know what to predict.

We must watch well or we will be buried beneath the ground where grows the tree of knowledge. Let us feel that the cloak of protection is thrown around us in this our joint session and all are admitted into our councils.

We stand with outstretched arms to grasp every breeze which comes from your society that it may carry a soothing sound to our attentive ear, realizing that if we stand still we will sink as stupidly as the reptile withering in his rocky crevice.

The oldest members here could arise and report the progress and continue their triumphant march toward the rising sun of a glorious scientific future.

We are glad to have you with us feeling that we may profit equally the same as you by our association.

The strings of the great harp are fingered in unison by every member of our society, which is playing a *hearty greeting* and extending the welcome hospitalities of our *Society*, city and public in general to you.

We hope that the melodious tones may long sound in your ears after we have parted from you and that the echo may come back to you in your solemn hours with whispering sounds which will add joy and comfort. That it may have the keenness of the painter's power which portray with a single stroke a lasting memory of the progress in our profession and that it will be as soothing as a mother's lulling hush in human troubles.

Again, in the name of the Iowa State Dental Society, we bid you a hearty welcome.

At the conclusion of President Fullerton's address, Dr. Kulp introduced the joint societies to the Mayor of Davenport, and said:

Thirty years ago the Iowa State Dental Society was organized at Muscatine. It has held annual sessions ever since. This is the fourth time it has met in Dav-

enport. Once before we had a meeting such as we have to-day. Our sister society, of Illinois, was organized twenty-nine years ago, so that we are both of age, and have done an amount of work that is creditable to both societies. Our sister society (Illinois) has outstripped us in the way of scientific work, because they have had larger facilities than we have had, although we have done much for our own State, which has helped to advance dental education. Illinois has also done well in this line. We are not envious of her reputation. We gladly welcome her members a second time to our city to open a joint session or union meeting of both societies.

I have now the pleasure and honor of presenting to you, at the twenty-ninth annual meeting of the Illinois and thirty-first annual meeting of the Iowa State Dental Societies, the Mayor of Davenport, Hon. Henry Vollmer, who will deliver an address of welcome.

Mayor Vollmer was warmly received on rising to speak. He said:

Mr. President and Gentlemen:

To use a traditional phrase common on occasions such as this by gentlemen in my place, I may say in response to your hearty introduction, that it gives me great pleasure to have the privilege of bidding welcome to our city so distinguished and intelligent a class of men. But it is more gratifying to me to be able on this occasion to use this traditional phrase, not merely from custom, but from conviction, that I am thereby extending municipal courtesies to a large and representative gathering of members of the most progressive profession of the age; for I think nobody will accuse me of flattery when I say that no profession has made so great an advance within the last twenty years as that of dentistry. In this Electric age, as President Fullerton has fitly termed it, nothing seems impossible; but it is a matter of especial self-congratulation on our part as Americans to be able to say that the American dentist finds not his peer among the nations of men that will in this Columbian year gather together and vie with each other in the exhibition of their product, their knowledge and skill. (Applause.)

Unlike some other professions I might mention, it does not draw its inspiration from the ancient seats of learning in far distant lands, but the foreigner must come to America's hospitable shores if he would get the latest results of applied science in your domain, for which, I think, we may all be justly proud. As a matter of course, it is but fitting that you as representatives of this most progressive profession should select as the place of holding your convention the most progressive and liberal city in Iowa, for such in our inborn modesty we Davenporters esteem ourselves. (Laughter and applause.)

We hope you will feel at home with us in your stay. I trust our people, being familiar with you, will not get a bad attack of the toothache in the presence of so formidable a gathering. Our police department has learned some things from dental surgery. It can extract useless and injurious members of society. I will say now that if any of you should be so unfortunate as to contract during your stay with us a case of police court inflammation, remember that the Mayor possesses large powers of counter-irritation. I hope, at any rate, that none of you will do as a gentleman recently did, who came here and attended a convention of

this sort, then left us and carried away, doubtless from excessive brain work during that occasion, a very severe case of "head swelling," and attributed it to the city's water supply. (Applause.)

Gentlemen, I merely came here this morning to assure you on behalf of the citizens of Davenport, a hearty welcome. We hope your deliberations will be both pleasant and profitable. If there is anything you don't see, ask for it, and if you don't get it you will go to Rock Island and be satisfied anyway. (Applause.)

These addresses of welcome were responded to by Dr. E. K. Blair, President of the Illinois State Dental Society, in the following words:

Mr. President and Gentlemen:

On behalf of the Illinois State Dental Society, I accept with thanks the very hearty welcome tendered by the President of the Iowa State Dental Society and the Mayor of this beautiful city,

I was impressed, as I came in at the door, with the place of meeting. Certainly it is a delightful room to hold our session in. I have also been impressed with the addresses delivered by the gentlemen who have just preceded me.

I feel disappointed that we are short in number at this, the opening session of the Illinois State Dental Society, compared with former meetings. I learned whilst coming across in the ferry boat that the Iowa State Dental Society would outstrip us in numbers. We regret this, but what we lack in numbers I assure you we will make up in enthusiasm and in our efforts to promote the welfare of the profession and to add to the general interest of the union meeting.

Some years ago these two societies had a similar meeting at this place with very pleasant results. Let us hope as much for this meeting and bend our energies to make it a complete success. On a former occasion my friend, Dr. T. L. Gilmer, presided at a meeting held here. He had previously lived at the same place that I do at present, (Waverly), so that it seems to be the lot of Waverly dentists to act as President of the Illinois Society when we meet in this locality.

Dr. Gilmer served the society ably and efficienty, and I esteem it a privilege as well as an honor, to follow in his wake in this particular, and I shall to the best of my ability discharge the duties that devolve upon me. We Illinoisans will not be outdone in hospitality by any of our neighbors, especially our Iowa friends. In fact our border cities have long borne the reputation of supplying your spiritual wants in more ways than one. So pleasantly and so cordially united spiritually let us hope to enjoy this professional union of these two societies and to derive much benefit therefrom.

A full and prompt attendance at each meeting and a free discussion of papers found upon our program will profit us all very much. When we are done with this meeting let us turn our thoughts to the World's Columbian Dental Congress. It will, as you know, be held upon Illinois soil, and in its behalf I extend to all of you a cordial invitation to attend.

On motion, all dentists, except nonmembers residing in Illinois and Iowa, and physicians, were granted the privileges of the floor.

The report of the Committee on Dental Science and Literature was then read by Dr. T. L. Gilmer of Chicago.

The report was discussed by Drs. W. A. Stevens, E. Noyes, and C. N. Johnson, all of Chicago; Hans Block, Dresden, Germany; W. H. Steele, Forest City, Iowa, and A. W. Harlan, Chicago.

Adjourned.

FIRST DAY—TUESDAY—AFTERNOON SESSION,

AT ROCK ISLAND.

The joint session was called to order at 2:15 P. M., by President Blair.

Invocation, by the Rev. W. S. Marquis.

The following address of welcome was then delivered by the Mayor of Rock Island, Hon T. J. Medill, Jr:

Mr. President and Gentlemen of the Illinois and Iowa State Dental Societies:

I am quite pleased to meet you on an occasion of this kind and take pleasure in extending to you a welcome to our city. During your sojourn in the city you will find a number of points of interest which you might visit with profit as well as pleasure. Our city is built on historic ground; surrounding us are places made famous by the red men. The committee in charge will no doubt see that you have the opportunity to visit these points of interest, and also to visit the island of Rock Island upon which is located one of the greatest arsenals in the world. The object of your convention, I presume, is to exchange views relative to your profession, thus enabling each of you to augment your own knowledge by ideas from neighboring practitioners. This I would deem a commendable object and one productive of good results.

I will not detain you with a lengthly address, as I presume you have much to do in your convention. I trust your deliberations will be productive of much good, and in conclusion will again extend to you a hearty welcome. (Applause.)

Response by President Fullerton on behalf of the Iowa State Dental Society:

Gentlemen of the Convention:

It is only necessary for me to say that we feel already that you have welcomed and received us in a proper manner; and while the ground has been made historic by red men, as has been said by your honorable Mayor, we hope to make it still more historic by the recollections of the work we shall do in joint session. On behalf of the profession of Iowa, I accept the hospitality extended to us by the Mayor and members of the Illinois State Dental Society. (Applause.)

Dr. Blair relinquished the chair to Dr. Fullerton.

Dr. J. E. Cravens read a paper entitled:

Is Immediate Root Filling Advisable—*First*, after heroic extirpation of live pulp. *Second*, after removing devitalized pulp. *Third*, after removing putrescent pulp. *Fourth*, where there is peridental membrane abscess with fistulous opening. *Fifth*, the same without fistulous opening. *Sixth*, what preparatory treatment should each condition receive, and with what material should roots be filled.

The discussion was opened by Dr. A. W. Harlan, Chicago, and continued by G. V. Black, Jacksonville; Edmund Noyes, Chicago; George D. Sitherwood, Bloomington; I. P. Wilson, Burlington; L. C. Ingersoll, Keokuk, and the discussion closed by the essayist, Dr. J. E. Cravens.

Dr. J. J. R. Patrick of Belleville, Ill., read a paper on "The Effects of Eruptive Diseases of the Teeth."

The discussion was opened by Dr. G. V. Black, Jacksonville, followed by W. N. Morrison, St. Louis; I. P. Wilson, Burlington; F. H. McIntosh, Bloomington; J. W. Cormany, Mt. Carroll; A. C. Hewett, Chicago; A. W. Harlan, Chicago; E. K. Blair, Waverly; L. C. Ingersoll, Keokuk; W. O. Kulp, Davenport, and closed by the essayist, Dr. J. J. R. Patrick.

Adjourned.

FIRST DAY—TUESDAY—EVENING SESSION,

AT ROCK ISLAND.

The meeting was called to order at 8 P. M., by President Fullerton of Iowa.

Dr. G. V. Black of Jacksonville read a paper entitled: "The Anchorage of Fillings."

The discussion was opened by Dr. George H. Cushing, Chicago, followed by J. J. R. Patrick, Belleville; Edmund Noyes, Chicago; Hans Block, Dresden, Germany, and closed by the essayist, Dr. Black.

Adjourned.

SECOND DAY—WEDNESDAY, MAY 10—MORNING SESSION,

AT DAVENPORT.

The joint session was called to order in the Masonic Temple at 9.30 A. M., by President Blair.

Dr. A. C. Hewett of Chicago read a paper entitled, "Things Old, New and Useful in the Operating Room."

The discussion was opened by Dr. A. O. Hunt, Iowa City, followed by L. C. Ingersoll, Keokuk; T. L. Gilmer and C. N. Johnson, Chicago; W. N. Morrison, St. Louis; Hans Block, Dresden, Germany; G. V. Black, Jacksonville; A. W. Harlan, Chicago; F. H. McIntosh, Bloomington; H. H. Townsend, Pontiac; Garrett Newkirk, Chicago; H. N. Edwards, Des Moines; W. A. Stevens, Chicago, and E. K. Blair, Waverly.

Adjourned.

SECOND DAY—WEDNESDAY, MAY 10—AFTERNOON SESSION,

AT ROCK ISLAND.

The meeting was called to order at 2:30 P. M. by Dr. L. K. Fullerton, of Iowa, and the discussion of Dr. Hewett's paper was then closed by the essayist.

Dr. A. O. Hunt, of Iowa City, read a paper entitled, "Iowa's Share in the History and Progress of Dentistry."

The subject being, on motion, passed, Dr. C. B. Rohland, of Alton, read a paper on "Conservatism in Crown and Bridge Work."

The discussion was opened by Dr. W. H. Taggart, Chicago, followed by W. O. Kulp, Davenport.

The subject was passed.

Adjourned.

SECOND DAY—WEDNESDAY, MAY 10—EVENING SESSION,

AT ROCK ISLAND.

The meeting was called to order at 8:30 P. M. by President L. K. Fullerton, of Iowa.

Dr. A. W. Harlan read a paper entitled "Recent Additions to the Therapeutics of Pyorrhœa."

The discussion was opened by Dr. Garrett Newkirk, Chicago, followed by G. V. Black, Jacksonville; W. A. Stevens, Chicago; F. H. McIntosh, Bloomington; Geo. D. Sitherwood, Bloomington; C. N. Johnson, Chicago, and closed by the essayist.

Dr. E. H. Allen, of Freeport, then read the report of the "Committee on Dental Art and Invention."

Adjourned.

THIRD DAY—THURSDAY, MAY 11.

AT DAVENPORT.

The forenoon was devoted to clinics (see report of the Supervisors of Clinics).

THIRD DAY—THURSDAY, MAY 11—AFTERNOON SESSION,

AT DAVENPORT.

President Blair, of Illinois, called the meeting to order at 2:30 P. M.

Dr. J. Taft, of Cincinnati, read a paper entitled "History of the Progress of Dentistry in the West."

The discussion was opened by Dr. George H. Cushing, Chicago, followed by Hans Block, Dresden, Germany; W. O. Kulp, Davenport; A. W. Harlan, Chicago; Charles Blake, Sr., San Francisco; L. C. Ingersoll, Keokuk; G. V. Black, Jacksonville, and closed by the essayist, Dr. Taft.

The subject was passed.

Dr. Grafton Munroe, of Springfield, read a paper entitled "Guardianship of the Teeth, Parental, Personal, Professional."

The discussion was opened by Dr. T. L. Gilmer, Chicago, followed by Garrett Newkirk, Chicago; H. H. Townsend, Pontiac, and G. V. Black, Jacksonville.

Adjourned.

On Thursday, May 11, from 8 to 12 P. M., the members of the joint convention were tendered a reception by the Tri-City Dental Association, at the Masonic Temple, Davenport. About two hundred were present.

FOURTH DAY—FRIDAY, MAY 12.

At Davenport.

The afternoon was devoted to clinics. (See report of the Supervisors of Clinics.)

FOURTH DAY—FRIDAY, MAY 12—Evening Session

At Rock Island.

The meeting was called to order by Garrett Newkirk, President-elect of the Illinois State Dental Society.

Dr. E. A. Royce read the "Report of the Supervisors of Clinics."

Discussed by Dr. W. T. Magill, Rock Island, followed by T. W. Prichett, Whitehall; E. A. Royce, Chicago, and W. A. Stevens, Chicago.

SUBJECTS FOR DISCUSSION.

"Local Anæsthetics; When and How to Use Them."

Discussion opened by Dr. A. C. Hewett, Chicago.

"Is Implantation a Successful Operation?"

Discussed by W. N. Morrison, St. Louis; A. W. Harlan, Chicago; A. C. Hewett, Chicago; G. V. Black, Jacksonville, and Louis Ottofy, Chicago.

"Do Gold Fillings of the Present Day Preserve the Teeth Better than Those Made Forty Years Ago?"

Discussed by George H. Cushing, Chicago; G. V. Black, Jacksonville; A. W. Harlan, Chicago; C. N. Johnson, Chicago; W. O. Kulp, Davenport, and E. A. Royce, Chicago.

The subjects were passed.

Adjourned *sine die.*

LOUIS OTTOFY,
Secretary Illinois State Dental Society.

F. T. BREENE,
Secretary Iowa State Dental Society.

MINUTES

OF THE

ILLINOIS STATE DENTAL SOCIETY.

MEETING OF 1893.

FIRST DAY—TUESDAY, MAY 9—Morning Session.

The twenty-ninth annual meeting of the Illinois State Dental Society was called to order at 10 o'clock, in the Council Chamber at Rock Island, by the President, Dr. E. K. Blair, of Waverly.

The roll call showed that thirty-five members were present at the opening session.

On motion, the society adjourned to meet in joint session with the Iowa State Dental Society at the Masonic Temple, Davenport.

FOURTH DAY—MAY 12—Morning Session.

The meeting was called to order at 10 A. M. by the President.

The minutes of the last session were read and approved.

The Secretary made announcements of the elections and appointments made by the Executive Council.

The President appointed Drs. T. L. Gilmer, H. H. Townsend and B. D. Wikoff a committee on the nomination of candidates for the Executive Council.

The Society proceeded to the election of President and Vice President, with the following result:

Garrett Newkirk of Chicago, President; J. W. Cormany of Mt. Carroll, Vice President.

The Nominating Committee reported the names of E. K. Blair of Waverly, C. N. Johnson of Chicago, and S. F. Duncan of Joliet, as members of the Executive Council.

The Society by unanimous vote concurred in the recommendation of the committee.

The President appointed Drs. Cormany and Johnson to conduct the newly elected President to the chair.

The retiring President then made the following remarks:

Dr. Blair: I wish to thank the members of the Society present and the entire body for the courtesies they have extended to me whilst I have presided, and to say that I am grateful to you for the compliment which you conferred upon me when you elected me your President. I sincerely hope and trust that I have said or done nothing that will give any of you any cause for regret in having elected me President of this Society. I trust further that anything I may do in the future will give you no cause for regret. I have esteemed it a great honor to preside over this meeting, and I again thank you. (Applause.)

The President-elect, on taking the chair, spoke as follows:

Dr. Newkirk: Gentlemen of the Illinois State Dental Society: This is probably the proudest moment of my life. The greatest honor I have ever received has been conferred upon me, and I appreciate it more than language can express. I think it was fitting a year ago that within the shadow of the House of Representatives in this State, where Dr. Blair had sat as representative from his district, had been so faithful to our legislative interests, and had done so much for the profession, he should have been elected President of the Illinois State Dental Society; also upon the anniversary of the year, 400 years ago, when this country was discovered by that great man, who in a little boat set his face against the Western darkness and started out for the discovery of the new world. But for him we would have had no country and no legislatures. This year is memorable in the same connection from the fact that we are to celebrate this great event with the greatest exposition by far which the world has ever seen, and all that pertains to progress and civilization. I think it is a happy thing to be elected President of this society at this time. In this connection I wish to ask every member of this society to take a deep and active interest in the approaching International Dental Congress, which will probably be the largest in the history of dentistry. I hope we shall all

feel the importance of the occasion, and be willing to make every sacrifice necessary, that by our individual and collective efforts it may be made the grandest of this or any other century. (Applause.)

I thank you for the kindness you have shown toward me, and for the high honor you have conferred upon me, which I most highly prize. (Applause.)

The Vice-President elect, Dr. Cormany, was then introduced, and said:

I thank you for the honor conferred on me. I always enjoy the meetings of this society. This is my sixteenth year, and I have missed but one meeting. I hope to continue to attend the meetings of this society until I can't travel any more. (Applause.)

The president appointed the following Publication Committee: Drs. Louis Ottofy, A. W. Harlan and Edmund Noyes.

During the four days' meeting the Secretary at various times announced the following as having been elected to active membership by the Executive Council:

Cigrand, B. J., B. Sc., D. D. S., Chicago.
Daymude, O. M., Monmouth.
Eiles F. Stanley, M. D., D. D. S., Blue Island.
Gluesing, J. W., D. D. S., Moline.
Goodmanson, J. Sidney, D. D. S., Tiskilwa.
Gordon, Byron, Moline.
Harper, W. E., D. D. S., Chicago.
Helm, C. B., D. D. S., Rockford.
Hilton, John, Freeport.
Stover, F. G., D. D. S., Rockford, and
Sprinkle, J. M., Nokomis, elected at a previous meeting, but failing to qualify he was placed on the roll of membership on recommendation of the Board of Directors.

The minutes of the present session were read and approved.

On motion, the Society adjourned to meet at Springfield, on the second Tuesday in May, 1894.

LOUIS OTTOFY,
Secretary.

1893.

PROCEEDINGS

OF THE

EXECUTIVE COUNCIL,

ILLINOIS STATE DENTAL SOCIETY.

FIRST MEETING—TUESDAY, MAY 9.

The Executive Council met in the City Hall, Rock Island, at 9:30 A. M. Present: Cushing, Jennelle, Allen, Blair, Stevens and Ottofy.

Dr. J. W. Cormany, of Mt. Carroll, was elected to fill the vacancy on the Council caused by the absence of Dr. C. P. Pruyn.

The resignations of J. M. Blythe, J. D. Moody and Kate C. Moody were read and accepted.

The matter relating to the case of J. M. Sprinkle of Nokomis, who was elected in 1888, but failed to qualify, was referred to the Board of Examiners.

An Auditing Committee consisting of Drs. Jennelle, Cushing and Allen was appointed by the President.

The report of the Executive Committee was read and adopted so far as it relates to the programme for the Illinois State Dental Society.

REPORT OF THE EXECUTIVE COMMITTEE.

To the Executive Council of the Illinois State Dental Society:

Your Executive Committee would respectfully submit as the report of its work the programme and order of business as printed, with the following corrections:

No. XII., in which the name of Dr. A. W. McCandless should be erased and that of Dr. Garrett Newkirk inserted.

In No. XIV. Dr. Thos. L. Gilmer has consented to open the discussion but his name was inadvertantly omitted from the programme.

S. F. DUNCAN, Chairman.

The reports of the Secretary, Treasurer and Librarian were read and referred to the Auditing Committee.

REPORT OF THE PUBLICATION COMMITTEE.

ROCK ISLAND, May 9, 1893.

Mr. President and Gentlemen:

Your committee authorized the Dental Review Co., H. D. Justi & Son, publishers, to publish such portions of the Transactions of 1892 as they desired in the *Dental Review*, and in consideration therefor H. D Justi & Son paid all expenses except postage and mailing. Two hundred and fifty copies were bound in cloth and three hundred in paper. Cost of postage, delivery, etc., is included in the account of the secretary. About one hundred copies are still on hand.

Respectfully submitted.

LOUIS OTTOFY,
L. L. DAVIS,
GARRETT NEWKIRK.

SECRETARY'S REPORT.

ROCK ISLAND, May 9, 1893.

Mr. President and Gentlemen:

Your Secretary presents the following annual report:

Total active membership at the beginning of last meeting.....152
New members elected..... 24

Total at close of meeting.....176

There has been lost:

By death: H. H. Silliman of Chenoa..... 1

By resignation:

J. M. Blythe of Decatur.
J. D. Moody of Mendota.
K. C. Moody of Mendota..... 3

By nonpayment of dues:

A. B. Elmer of Rochelle.
H. C. Gill of Rockford.
L. F. Lattan of Chicago.
J. W. Stephens of Dixon.
J. F. Thompson of Chicago.
A. J. Waid of Monmouth..... 6

Total..... 10

Leaving the present membership 166

The number of corresponding members is increased by the election of Drs. C. S. Case and John G. Harper from 27 to 29, and decreased by the death of Dr. Geo. Watt to..... 28

By the death of Dr. Edgar Park the number of honorary members is reduced from 18 to..... 17

Total..... 45

The following is a statement of moneys received since the last annual report:

Dues received to date.....$85.00

Sale of a package of gutta-percha received from the previous Secretary. 1.50

$86.50

For which the Treasurer's receipt is herewith submitted.

LOUIS OTTOFY, Secretary.

Audited and found correct.

GEO. H. CUSHING,
J. J. JENNELLE,
E. H. ALLEN. } Auditing Committee.

TREASURER'S REPORT.

ROCK ISLAND, May 9, 1893.

To the Executive Council:

1892—Dr.			
May 10.	To balance in last Report.....		$ 147.38
" 13.	Received from Secretary.....		425.00
June 10.	" " "		10.00
1893—May 9.	" " "		86.50
			$ 668.88
1892—Cr.	Paid orders as follows:		
May 13.	Order 117.	Expenses of Executive Committee....	$ 70.00
" 13.	" 118.	Secretary's salary.....	100.00
June 14.	" 119.	Stenographer's services.....	100.00
Nov. 3.	" 120.	McCluer Printing Co.....	63.75
1893—May 8.	" 121.	Louis Ottofy, (Secretary's expenses)...	27.60
			$ 361.35
Balance.....			$ 307.53

W. A. STEVENS, Treasurer.

Audited and found correct.

J. J. JENNELLE,
GEO. H. CUSHING,
E. H. ALLEN, } Auditing Committee.

LIBRARIAN'S REPORT.

I have not carried out what I intended doing in my last recommendations to the Society, save the purchasing of a receptacle for the transportation of albums, reports, etc.

Respectfully submitted.

F. H. MCINTOSH, Librarian.

Dr. R. H. Antes was appointed to fill the vacancy on the Committee on the Infraction of the Code of Ethics, created by the resignation of Dr. J. M. Blythe.

The Treasurer was authorized to pay all properly authenticated bills.

A Committee on Necrology, consisting of Drs. J. Frank Mariner, J. M. Barcus and A. J. Curry, was appointed by the President.

FIRST DAY—SECOND MEETING.

The Council was called to order by the President at 2 P. M. Present: Blair, Stevens, Robbins, Allen, Ottofy and Cormany.

On motion, Drs. C. N. Johnson and J. F. Mariner were elected to serve on the Council to fill the vacancies created by the absence of Drs. K. B. Davis and O. A. Chappell.

The minutes of the previous meeting were then read and approved.

On motion, the President was authorized to fill vacancies on committees.

The President appointed Drs. C. N. Johnson, Garrett Newkirk and D. E. Coulson to act as a Board of Examiners in the absence of the regular members of the Board.

The President appointed on the Committee on the Infraction of the Code of Ethics, as associates to Dr. Antes appointed at the morning session, Drs. Frank J. Raymond and G. D. Sitherwood.

On motion, adjourned.

SECOND DAY—FIRST MEETING.

The Council was called to order by the President at 2 P. M. Present: Blair, Cushing, Allen, Jennelle, Robbins and Ottofy.

On motion, Dr. Magill was appointed to fill the vacancy on the Council created by the absence of A. S. Waltz.

Dr. Stevens was present later in the session.

The minutes of the previous meeting were read and approved.

Dr. Cushing offered a resolution regarding the publication of the Transactions in union with the Iowa State Dental Society, which was on motion, referred to be submitted to the publication committee of the Iowa State Dental Society.

The auditing committee reported that it had examined the reports of the Secretary and Treasurer, and had found them correct.

The report was adopted.

The report of the Librarian was adopted.

The report of the publication committee was read, and on motion, adopted.

The incoming President was appointed to deliver the next annual address.

The Secretary was instructed to announce that the next meeting, under the rules, will be held at Springfield.

On motion, adjourned.

SECOND DAY—Second Meeting.

The Council was called to order at 8 P. M., by the President. Present: Blair, Cushing, Jennelle, Allen, Magill and Ottofy.

Dr. T. W. Prichett was elected to fill the vacancy created by the absence of Dr. E. C. Stone, of Galesburg.

The reading of the minutes was postponed until the next meeting.

The following names were proposed for membership by the Board of Examiners:

F. Stanley Eiles, M. D., D. D. S., Blue Island; Byron Gordon, Moline; J. W. Gluesing, D. D. S., Moline; F. G. Stover, D. D. S., Rockford; W. E. Harper, D. D. S., Chicago; C. B. Helm, D. D. S., Rockford; B. J. Cigrand, B. Sc., D. D. S., Chicago.

These names having been duly posted, they were voted on, and all were elected.

The Board of Examiners also reported that in their opinion the Secretary should place the name of J. M. Sprinkle of Nokomis, on the roll of members, Dr. Sprinkle having been elected in 1888, but failing to qualify through some error not now determinable.

On motion, adjourned.

THIRD DAY—First Meeting.

The Council was called to order at 5:30 P. M., by the President. Present: Robbins, Stone, Blair, Allen, Jennelle, Stevens, Cushing, Cormany, Magill and Ottofy.

Dr. Noyes' resignation as a member of the Committee on Dental Science was read, and on motion, accepted.

It was moved and seconded that in the standing resolution relating to the Committee on Dental Science and Literature, the word "three" should be stricken out, and the word "one" substituted therefor, the Committee on Dental Science hereafter to consist of one instead of three members.

Carried.

Dr. E. H. Allen was appointed on the committee on "Dental Art and Invention" to succeed himself.

A motion, was carried that the Secretary be instructed to tender a proposition to the Executive Committee of the Iowa State Dental Society to pay half of the expenses of the meeting.

The following vote of thanks was, on motion, adopted:

The Illinois State Dental Society desire to extend their sincere thanks to the Iowa State Dental Society for their many kind courtesies which have tended to make our meeting such a pleasant and profitable one, and to the Tri-City Dental Association for their delightful hospitality which has enabled us to meet socially and to become better acquainted.

Also to the hotels and railroads for reduced rates, the ferry company, the street car company, the Mayor and authorities of Rock Island for kindly welcome and for the use of their offices for our meetings.

And especially to the local committee for their prompt and constant attention to our wants.

The following vote of thanks was, on motion, adopted.

The Illinois State Dental Society desire to extend their thanks to the S. S. White Dental Manufacturing Co., for printing and distributing programmes.

The following named were elected officers for the ensuing year :

Secretary—Louis Ottofy of Chicago.

Treasurer—W. A. Stevens of Chicago.

Librarian—F. H. McIntosh of Bloomington.

Member of the Executive Committee—J. M. Barcus of Carlinville.

Committee on the Infraction of the Code of Ethics—J. G. Dickson of Carmi; E. R. Warner of Chicago; F. Primrose of Springfield.

Local Committee of Arrangements—S. L. LeCron, Chairman, H. M. Prickett, and Grafton Munroe, all of Springfield.

Supervisor of Clinics—E. A. Royce of Chicago.

(Dr. Royce later appointed as his assistants, Drs. A. H. McCandless of Rock Island, and B. D. Wikoff of Chicago).

Board of Examiners—C. B. Rohland of Alton.

The usual salary of $100 was voted to the Secretary.

On motion, President Blair was instructed to notify any who may have violated the code of ethics during the year.

On motion, adjourned.

FOURTH DAY—First Meeting.

The council was called to order by the President at 9:30 A. M.

Present: Stevens, Blair, Cushing, Allen, Cormany, Magill, Jennelle and Ottofy.

Dr. Blair, Chairman of the Committee on Dental Legislation, made a final report, which was on motion adopted, and the committee discharged.

Adjourned.

FOURTH DAY—Second Meeting.

The Council was called to order at 11 A. M., by President Newkirk. Present: Stevens, Jennelle, Cushing, Blair, Johnson, Ottofy, Stone, Duncan, Newkirk, Allen and Robbins.

The minutes of the two previous meetings were read and approved.

The following named were proposed for membership by the Board of Examiners:

O. M. Daymude of Monmouth; John Hilton of Freeport; J. Sidney Goodmanson, D.D.S., of Tiskilwa.

These names having been duly posted, they were voted on, and all were elected.

The report of the Committee on Necrology being incomplete, the committee was instructed to complete it.

The following amendments to the Constitution were presented:

Amend Sections 3 and 4, of Article I, of the By-Laws, by adding to Section 3: "And shall give a bond in amount as required by the Executive Council before entering upon his duties."

Add to Section 4: "And shall give a bond in amount as required by the Executive council before entering upon his duties."

W. A. Stevens,
George H. Cushing,
J. W. Cormany,
Thomas L. Gilmer,
G. V. Black.

On motion the President and Secretary were authorized to draw an order for the payment of three-fourths of the money remaining in the treasury, to the Executive Committee of the World's Columbian Dental Congress, after all the expenses of the present session are paid. This was passed by a unanimous vote.

On motion, adjourned.

FOURTH DAY—Third Meeting.

The Council was called to order by the President at 7:30 P. M. Present: Duncan, Newkirk, Stevens, Johnson, Ottofy, Cushing and Stone.

On motion, Drs. G. V. Black and T. W. Prichett were elected to fill the places of absent councilmen.

On motion, it was adopted that this society pay one-half of the expenses of the joint session.

On motion, the Secretary was instructed to notify the Executive Committee of the Iowa State Dental Society, that it is the opinion of the Council, that either the owner of the Masonic Temple, Davenport, or the owner of the chair, is responsible for the damage to a dental chair reported to the Council by Dr. Duncan, and that in the opinion of the Council the persons mentioned are liable for the expense; *however*, that if the local committee of arrangements is responsible, the Illinois State Dental Society will defray one-half of the expenses necessary to repair the damage.

The bills of the librarian and local committee of arrangements were, on motion, allowed, and the Treasurer instructed to pay them.

On motion, the Secretary was instructed to notify the Chairman of the Committee on Necrology to revise its report, and to add thereto notices regarding the deaths of H. H. Silliman, C. R. Dwight, G. S. Miles and George Watt. The Committee was instructed to report at the earliest opportunity.

On motion, the Publication Committee was instructed to place the report of the Committe on Necrology on the memorial pages of the transactions.

On motion, adjourned.

LOUIS OTTOFY,
Secretary.

OBITUARY.

Herbert Haynes Silliman, M. D., D. D. S.

Died at his home in Chenoa, November 15, 1892. Dr. Silliman was born in Peoria County, July 5, 1868. He went to Chenoa with his parents in 1872. After graduating from the public schools of that city, he entered the office of Dr. Gallahue to prepare himself for a course in the Chicago College of Dental Surgery, from which he graduated in Class '89. And from Rush Medical College, Class '90; became an active member of the I. S. D. Society in May, 1890, and the same year began the practice of dentistry in Chenoa, where he soon obtained a lucrative practice, and where he has ever been a leading spirit among the young people of that city in social life, no gathering appearing complete without him. In the death of Dr. Silliman the I. S. D. Society loses a faithful member, a skillful operator, and in view of this expression of our deep regrets, we set apart this page in our "Transactions" as sacred, to his memory.

Edgar Park, D. D. S.

Died at Middleton, New York, August 12, 1892, in the fifty-second year of his age. He entered the Ohio Dental College in 1864, and graduated at the Missouri Dental College in 1869. He was for a short time associated with Dr. Allport, of Chicago, after which he went to St. Louis, accepting a position as assistant to Dr. C. W. Spalding in 1865. In 1867 he became associated with Dr. H. J. McKellops, remaining until 1870, when he opened an office of his own, continuing in practice until March, 1884, at which time his health failed, compelling him to retire. After an illness of eight years he died, as above stated. He was an active worker in the St. Louis Dental Society; received the highest honors in its gift. He was a member of a number of dental societies, both national and local, and one year Recording Secretary of the American Dental Association. And having at one time been a member and first secretary of the I. S. D. Society, and an honorary member at the time of his death, *Therefore, be it resolved*, That this expression of our regards and deep regrets, be placed on our records, to be laid away among the archives of the society as a memento that he was once one of its members.

George Watt, M. D., D. D. S.

Dr. George Watt died February 16, 1893, at Xenia, Ohio. Dr. Watt was born March 14, 1820, on a farm eight miles east of Xenia; commenced the study of dentistry in 1852; graduated with honor in 1854, resuming the practice of dentistry immediately thereafter. Dr. Watt has been for more than forty years a conspicuous figure in dental societies as a teacher and journalist, and his ability as such made him famous above most others in the profession. Dr. W. was a man of pleasant manner, a pleasant yet forcible speaker, always clear-headed in discussions; having retired from active practice some twelve years ago, he has during that time occupied the editorial chair, being the able editor of the *Ohio Dental Journal*. His life was a busy one, and his influence will long be felt. Dr. Watt was for many years a corresponding member of the I. S. D. Society, and will be remembered by its entire membership.

George S. Miles, D. D. S.

Died Feb. 7, 1892. We were pained to hear of the sudden and untimely decease of Dr. George S. Miles, of Beatrice, Neb., formerly a citizen of Illinois, and for many years a faithful member of the I. S. D. S., and in 1871, its President. In the death of Dr. M., the dental profession loses a skilled and honored practitioner, the home an affectionate husband and indulgent father, and society a most useful and respected member. He had reached the days of his greatest usefulness, days when his ripe experience and wise counsel gave to his family and fellow men his best service. But the summons came, and came quickly, and he has gone to the unknown country, leaving behind the memory of a life conspicuous for its manly virtues, and noble and enduring qualities. Dr. Miles is dead, but his memory will live, and brighten and brighten as time steals away. The family have the sympathy of a large circle of friends in Illinois, and the entire membership of the I. S. D. Society.

Dr. C. R. Dwight,

Formerly of Danville, Ill., and for many years an active, faithful member of the I. S. D. Society, died at Salt Lake City, Utah, Dec. 22, 1892. He was always interested in, and working for the advancement of his chosen profession. Always a prominent figure at the meetings of the I. S. D. S., until failing health compelled his absence, and caused him to seek another climate, and in his search finds the beautiful Salt Lake City, where doubtless his life was for a time prolonged, but the summons came, and dear friends, climate, with beautiful surroundings were unable to longer hold him back, and in spite of all these he gently passed over, and joined the silent majority. As a man, he was honest; as a dentist, faithful; as a friend, true as steel; as a citizen, upright. His friends have the sympathy of the membership of the I. S. D. Society.

W. W. Allport, M. D., D. D. S.

Died at his residence, No. 69 Maple Street, Chicago, March 21, 1893. Dr. Allport was at one time a member of the I. S. D. Society, and for nearly forty years one of Chicago's prominent dentists. Dr. Allport was born at Lorain, Jefferson county, New York, in June, 1824. In 1846 he determined to devote himself to dentistry, and in 1854 commenced the practice in Chicago, where he continued to practice until a few weeks before his death. In 1858 Dr. Allport was elected President of the "Western Dental Society." In 1865 President of the "American Dental Convention." In 1886 President of the "American Dental Association." He was a man of striking individuality, quick to see and quick to act. He was considered authority on all subjects pertaining to dentistry. Was a member of Grace Episcopal church. He was modest, unassuming, and yet commanding in appearance. Dignified, and at all times perfectly poised and polite. He was, as a friend, warm in his attachments, tender in his sympathies, and fearless as a lion in his convictions, and in ability a giant. It has been said of him that he was the peer of any man, living or dead, as an operator. Dr. L. P. Haskell, who probably knew him as well as any man living, says: "He was a remarkable man in some respects. Has always been my *beau ideal* as an operator; in fact, I have never seen his equal. I mean in his entire make-up, and feel that we will never look on his like again. The profession is certainly a great loser, and I regret he could not have lived till after the Columbian Congress."

Dr. Allport leaves to survive him his widow and three sons, two of whom, Frank and Walter H., are practicing physicians.

He is gone, and we mourn for him.

J. Frank Mariner,
J. M. Barcus,
A. J. Curry,
Committee on Necrology.

IN MEMORIAM.

AUSTIN, J. F.
BAKER, D. B.
DAVIS, E. F.
DEAN, M. S.
FORBES, ISAIAH.
GEORGE, ISAAC.
HAND, M. F.
HARRINGTON, G. H.
HAWXHURST, D. C.
HENDEL, J. W.
JUDD, HOMER.
KEELY, GEORGE W.
LEWIS, C. W.
LEWIS, H. N.
MORRISON, A. M.
PARK, EDGAR.
REYNOLDS, J. S.
RIVERS, C. W.
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There
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His patients
As those
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